**DOCTORAL THESIS**

# Attachment and mentalizing in Counselling Psychologists and psychotherapists
# An exploration using self-report, behavioural and eye-tracking measures

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# Attachment and mentalizing in Counselling Psychologists and psychotherapists: An exploration using self-report, behavioural and eye-tracking measures.

by

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**ABSTRACT**

In recent years, the psychotherapeutic world has become increasingly interested in the characteristics of the relationship between client and therapist. Two key influences on this relationship are the therapist's ability to mentalize and the therapist's attachment style (or the degree to which they are securely or insecurely attached). The main aim of this study was to evaluate mentalizing abilities and attachment orientation in therapists, but in particular to explore the relationship between the two. A group of 20 therapists and a matched group of 21 non-therapists undertook a battery of self-report, behavioural and eye-tracking mentalising tasks, and a self-report attachment questionnaire. Mentalizing tasks were designed to measure various aspects of mentalizing including not only mental state comprehension but also the proclivity to use mentalizing skills. In terms of group differences, therapists showed a greater proclivity to use elaborative mental state language and a greater focus on social cues when visually scanning the same situations. Therapists also demonstrated a self-reported higher level of affective and cognitive empathic ability than non-therapists. However, in behavioural terms, therapists did not evidence a significantly enhanced ability in traditional Theory of Mind tasks, emotion understanding, or visual perspective taking tasks. Thus, therapists generally exhibited a greater tendency to process some but not all aspects of social and emotional information more thoroughly. The influence of attachment orientation on the mentalizing skills of both the therapist and the non-therapist group was complex. Non-therapists tended to behave according to the expectations of previous attachment related research. For example, attachment anxiety was associated with poorer perspective taking and a preoccupation with the use of mental state words. Avoidant attachment correlated with a significant reduction in the first-fix looking time at social information. In the therapist group however, only two significant associations between attachment and mentalization were seen: avoidance and the proclivity to use mentalization skills as measured by the use of elaborative mental state language, and avoidance and self-reported empathy. No other significant influences of attachment on therapist mentalization appeared to exist. Thus, therapists who reported an insecure attachment orientation still generally managed to behave as though they were more secure. Some suggestions are made as to the underlying reasons for this phenomenon, and the clinical implications are discussed.

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## INTRODUCTION

### 1. Overview

#### 1.1. The main aims of this research

This study aims to contribute towards existing knowledge concerning two aspects of therapist relational characteristics, namely attachment orientation and mentalizing abilities. The main point of interest was the relationship between the two, and how this relationship might differ in comparison to the general population. This is considered highly relevant at a time when the psychotherapeutic world has become increasingly interested in the relationship between client and therapist (e.g. Norcross, 2002; Wachtel, 2008) and which therapist attributes might contribute towards its quality. A key influence on this relationship is the therapist's ability to mentalize, that is, to make inferences about the client's desires, beliefs and attitudes in order to understand his or her mental state and make sense of related behaviour (Astington, Harris & Olson, 1988; Baron-Cohen, 1995; Fonagy, Gergely, Jurist & Target, 2002; Frith & Frith, 2003; Premack & Woodruff, 1978). A second key influence is the therapist's own attachment style or the degree to which they are securely or insecurely attached (Bowlby, 1969/82, 1973, 1980).

Whilst there has been a small amount of existing research that has considered the mentalizing abilities of therapists (e.g. Hassenstab, Dziobek, Rogers, Wolf and Convit, 2007; Hall, Davis & Connelly, 2000) and an equally modest amount which has explored the therapist's own attachment style (for example, with respect to the relationship with therapists' experience of personal therapy, Rizq, 2011; Rizq & Target, 2010a, 2010b), no study to date has explicitly contemplated how attachment might directly affect therapists' mentalizing abilities (which clearly has specific consequences for the therapeutic relationship). Therapists represent an unusual group; they are highly experienced in mentalizing, and arguably may be more secure in their attachment behaviours due to personal reflection and training. The study therefore aims to evaluate the relationship between mentalizing abilities and attachment orientation in therapists and a well-matched non-therapist control group. By comparing the pattern of attachment and mentalizing in these two groups the effect of attachment on mentalizing might be better understood and conceptualised.

#### 1.2. Why is attachment and mentalizing important to therapists?

The quality of the therapeutic relationship is of enormous importance and continues to be seen by many as more important than theoretical modality or technique (Asay & Lambert,

1999) and research evidence supports its significance (Beutler & Harwood, 2002). For example, it is known that the quality of therapeutic relationship as rated by clients is significantly associated with therapeutic improvements (Krupnick, Sotsky, Simmens, Moyer, Elkin, Watkins, et al., 1996), that clients consistently report that the relationship with their therapist is more helpful than specific techniques employed (Keijsers, Schaap & Hoogduin, 2000), and that relational factors such as therapist empathy are considered by clients as particularly effective (Bohart, Elliott, Greenberg & Watson, 2002).

In acknowledgment of the nature and importance of this relationship, "the relational" as a concept first emerged in the psychotherapeutic literature in the eighties (e.g. Greenberg & Mitchell, 1983; Mitchell, 1988) although there continues to be much debate over how it is characterised (Loewenthal, 2010). Some have described an encounter that depends on how the therapist and client see and hear each other subjectively, that is "mutually constructed between two active participants, with the subjectivities of both patient and analyst contributing", (Lyons-Ruth, 1999, p. 576). Thus, in most therapeutic modalities, significant emphasis is placed on how this client/therapist relationship is negotiated in the therapeutic space, and it has been recognised that its effectiveness relies very much on certain of the therapist's relational characteristics. Indeed, client perception of therapists' characteristics are more significant influences on both process and outcome than many other therapeutic variables such as theoretical model (Beutler, Crago & Arizmendi, 1986), particularly clients' perceptions that counsellors understand their internal experiences (Greenberg, Watson, Elliott & Bohart, 2001).

One of the major influences on the ability of the therapist to relate to his or her client is likely to be the therapist's ability to mentalize, that is to make inferences about the client's desires, beliefs and attitudes in order to understand their mental state and make sense of their behaviour (Astington et al., 1988; Baron-Cohen, 1995; Fonagy et al., 2002; Frith & Frith, 2003; Premack & Woodruff, 1978). This mentalizing ability of the therapist is a key area of interest for this study, and whilst it is not considered in relation to therapeutic outcome or therapist effectiveness per se, it is proposed that mentalizing is directly relevant to the consideration of "the relational" in psychotherapy and is fundamental to a therapist's ability to connect to and understand his or her client.

It is important for therapists to understand their own individual mentalizing processes and attachment dynamics. These are individuals who generally consider themselves as relatively capable in aspects of relating and empathy (Hassenstab et al., 2007), and sufficiently aware of their own emotionally related behaviours, but this conclusion is often arrived at

through the use of self-report measures rather than experimental design (e.g. Hall et al., 2000). To address this, this study uses both self-report measures and experimental tasks. Further it considers many different dimensions of mentalizing, for example lower level socio-perceptual and higher level social-cognitive aspects. It also considers comprehension (understanding mental states) as well as production of mental state language (the proclivity to use mentalizing skills). Furthermore, it also explores potentially more subtle levels of mentalizing, for example social orientation as measure of mentalizing using eye-tracking technology. The use of an extremely comprehensive range of mentalizing measures represents a highly novel approach that has not been undertaken before.

As well as the need to consider therapist mentalizing per se as a potential influence on the ability of the therapist to relate to his or her clients in a responsive and available way, it is also unclear from the current literature whether, in turn, mentalizing is affected by other characteristics of the therapist such as the therapist's attachment style (Bowlby 1969/82, 1973, 1980). Original attachment theory envisages the therapeutic relationship acting in a very similar manner to that of a parent-child dyad, requiring the therapist to act as the "secure base" for exploration (Bowlby, 1988). Attachment research makes some suggestions as to how therapist attachment style might play out in the therapeutic work (e.g. Dozier, Cue & Barnett, 1994; Dunkle & Friedlander, 1996; Ligiero & Gelso, 2002; Sauer, Lopez & Gormley 2003). However, whilst studies have considered the attachment of therapists in isolation and it has been noted that the therapist's attachment style could be central to the therapeutic process (Slade, 2000), no one has so far considered role of therapist attachment style on affecting their ability to mentalize and this is the key main aim of the study, i.e. to explore and compare self-report attachment orientation and performance on a full range of mentalizing tasks in both therapists and a non-therapy group.

Research into the association between attachment and mental state understanding has so far focused extensively on children and their relationships with carers (e.g. Meins, Fernyhough, Wainwright, Das Gupta, Fradley & Tuckey, 2002; Ontai & Thompson, 2002, 2008) rather than focusing on adulthood. Moreover, although there have been some research paradigms incorporating aspects of both adult attachment and mentalizing (e.g. Allen, 2006; Fonagy et al., 2002; Fonagy, Gergely & Target, 2008; Slade, 2005), none has been directed specifically at a particular group of individuals for whom these two areas are highly important in their everyday lives, namely those involved in psychotherapeutic work. Whilst both adult attachment theory and the capacity for mentalizing are beginning to be recognised as genuine contributors to psychotherapeutic theory and clinical interventions (e.g. Allen 2006; Bateman & Fonagy, 2004; Fonagy, 2006), very little has been published concerning the relationship

between therapists' attachment and mentalizing capabilities. Rizq and Target (2010a) attempted to address this research vacuum by exploring both mentalizing and attachment in a small group of Counselling Psychologists using qualitative analysis, but made no claim as to generalizability and focussed primarily on personal therapy experiences. Thus certain questions remain pertinent for therapists concerned with the quality of their relational skills and their ability to connect with their clients: does attachment affect mentalizing in therapists in the same way as those without this background and training?

Importantly, because therapists undertake extensive training in emotional and mental state understanding generally including personal therapy, it is probable that their attachment behaviours may have changed, representing a movement towards earned security (Pearson, Cohn, Cowan, & Pape Cowan, 1994). In addition, they have often focussed significantly on the inhibition of aspects of themselves which might compromise their role as "mentalizer" and "secure base" for the client. Consequently, an informed view of the relationship between attachment and mentalizing in therapists can only really be explored by comparing therapists' patterns to those typically expected in the general population. Thus, to reach a more robust conclusion about the potential link between attachment and mentalizing, a matched control group was specifically used for comparison. In summary, the first main aim was to look at mentalizing in therapists by employing a broad range of measures. Second, of interest was whether and how attachment might affect this ability to mentalize. The study was therefore not interested in solely comparing the levels of attachment between two groups, but more specifically in the link between attachment and mentalizing within the two groups.

### 1.3. Empirical evidence of attachment and mentalizing in the general population

Attachment styles are generally predictive of functioning in adult life and in close relationships. For example, securely attached individuals seem consistently to hold more optimistic views about their ability to cope (e.g. Berant, Mikulincer & Florian, 2001; Mikulincer & Florian, 1995), to acknowledge and display emotions (e.g. Mikulincer & Orbach, 1995), to disclose personal information openly (e.g. Collins & Read, 1990; Mikulincer & Nachshon, 1991) and to seek support for regulating emotions (e.g. Ognibene & Collins, 1998). Secure individuals do not tend to worry about work or allow it to interfere too much with friendships or health (Hazan & Shaver, 1990).

Conversely for insecure attachment, anxiously attached individuals tend to ruminate on negative thoughts (Mikulincer & Florian, 1995), experience a greater degree of worry (Mikulincer, Florian, Birnbaum & Malishkewitz, 2002), are prone to overwhelming anger

(Mikulincer, 1998), and to self-devaluation (Mikulincer, Orbach & Iavnieli, 1998). Those high in avoidance tend to distance themselves from emotional bonds with others (Fraley & Davis, 1997) and from distress (Mikulincer & Florian, 1995), are less likely to turn to others for support and care (Simpson, Rholes & Nelligan, 1992), and exhibit high levels of distress and maladjustment in stressful situations (Mikulincer & Florian, 1998).

Hyperactivation/deactivation models suggest that cognitive processes play a role in appraising and monitoring the environment for cues regarding the proximity and accessibility of significant others (Fraley & Shaver, 2000; Mikulincer & Shaver, 2005). Avoidant individuals attempt to deactivate the attachment system's needs for proximity and protection by ignoring or dismissing significant events such as rejection or criticism and by suppressing emotion that would otherwise activate the system. Conversely, anxiously attached individuals employ hyper-activating strategies, often generating and intensifying negative emotional states which maintain the attachment system in a chronically activated state. Clearly, attachment style appears to have a direct effect on the ability of individuals to maintain relationships and on their feelings about themselves. It is no surprise therefore that many clients attending therapy do so because of maladaptive attachment-related behaviours and are potentially looking for a reparative relational (often parental) experience with their therapist (Fairbairn, 1958, cited in Wachtel, 2008; Frank, 1999).

Studies of adult mentalizing (see section 3) have become more prevalent following the development of particular mentalizing measures and tasks designed specifically for this age group. Whilst it had been thought that a capacity to mentalize was an all or nothing capability acquired at around four to five years old in the typical population (Wellman, 1990), it is now recognised that even typically developed adults do not perform at ceiling levels and clear individual differences exist.

Mentalization is seen by many as intricately linked to attachment. In typically developed adults, there is an expectation that secure attachment is associated with better mentalizing capacity, and the distortion of mentalizing ability is often seen as fundamental to instances of attachment disorders and psychopathology (Fonagy, et al., 2002; Fonagy & Bateman, 2008). Fonagy et al. (2002) consider mentalization as a basic human capacity linked to affect regulation and productive social relationships. The more a person is able to envision mental states in the self and others, the more they are likely to engage in productive and intimate social relationships and to feel connected but autonomous, in other words to possess a secure attachment.

A range of tasks has been developed to measure aspects of mentalizing which, for the most part, tap mental state comprehension (e.g. the "Reading the Mind in the Eyes" Test,

Baron-Cohen, Jolliffe, Mortimore & Robertson, 1997). However, an exciting and recent progression in measurement technique has been the development of tasks that address the proclivity to use mentalizing abilities. A novel example of this is the analysis of mental state talk (e.g. Ruffman, Slade & Crowe, 2002). The use of mental state talk is thought to represent the proclivity to use mentalizing capacity (Meins, Fernyhough, Johnson & Lidstone, 2006) which may be different to mental state comprehension demonstrated in an experimental task (for example, a classic false belief task). Thus, possession of a mentalizing capacity may be conceptualised as different from using it. This is consistent with perspective-taking research where evidence suggests that the proclivity to use one's mentalization capacity is as fundamental in reasoning about mental states as understanding them (e.g. Keysar, Barr, Balin & Brauner, 2000; Samson & Apperly, 2010). Indeed, assessing the "production" of mental state language may be a more sensitive measure of mentalizing than traditional measures.

Mental state talk in mothers and children has been found to be significantly related to and predictive of attachment security in children (Meins, Fernyhough, Fradley & Tuckey, 2001). Thus, as well as providing a sensitive measure of mentalizing per se, it was felt in this study that the analysis of mental state talk in therapists may provide a major insight into the interaction between attachment and mentalizing. As part of the battery of mentalizing measures, therefore, a novel mental state talk exercise was undertaken by both groups of participants in order to explore what differences may or may not exist between therapists and non-therapists in the way attachment might influence mental state talk production.

### 1.4. Empirical evidence of attachment and mentalizing in therapists

The key point of interest for this study is the effect of attachment on mentalizing. Empirical evidence specifically to do with therapists in this area, and indeed in related individuals, is extremely sparse. In terms of therapist attachment orientations per se, therapists might be expected to exhibit relatively secure attachment, since attachment insecurity in the therapist could interfere with the therapeutic process (Rubino, Barker, Roth & Fearon, 2000). Empirical evidence is on this issue is light, however. One study (Leiper & Casares, 2000) found 70% of Clinical Psychologists to be securely attached providing partial but inconclusive corroboration because (i) it does not relate specifically to psychotherapists, (ii) it mirrors the proportion of securely attached individuals in the general population, usually expected at 60-65% (e.g. van Ijzendoorn & Bakermans-Kranenburg, 1996), and (iii) it makes no comment or suggestion on the potential for "earned security" (Pearson et al., 1994) on the part of therapists during training. Whilst it might be expected that levels of security and insecurity are roughly comparable between therapists and non-therapists, what is interesting is to explore how levels of attachment insecurity relate to an aspect of the therapists' relational

abilities i.e. mentalizing, and by inference to their ability to act as the "secure base", and relate to and connect with clients.

Empirical evidence suggests therapists are more accurate than controls at detecting emotional information (e.g. Machado, et al., 1999), that therapists score more highly on cognitive empathy (e.g. Hassenstab, et al., 2007) but often self-report less personal distress in response to the distress of others (Hall et al., 2000). The inference is that therapists may represent a group with advanced empathic abilities, but are better able to control their own emotions in emotional situations, possibly because of frequent exposure to affectively charged interactions and an ability to moderate distress. Whilst this tells us something about empathy in therapists, there are fewer research findings applicable to either the assessment of more complex mentalizing abilities or the tendency to use such abilities. Only two findings relating to alternative but possibly relevant groups currently exist: psychics (Dziobek, Rogers, Fleck, Hassenstab, Gold, Wolf et al., 2005) and childcare personnel (Degotardi & Sweller, 2011). In the former, no enhanced mentalization skills were observed, and in the latter an enhanced mental state understanding was displayed through mental state talk in more sensitive practitioners.

To date there is no research published relating to how therapist attachment styles may influence mentalizing. It is known in children that mentalizing abilities and attachment styles are significantly related, the more securely attached a child is, the more likely he or she is to be able to pass false belief tasks (e.g. Fonagy, Redfern & Charman, 1997; Meins et al., 2001). In adulthood less is known, but it seems that a greater mentalizing capability is correlated with more secure attachment-related behaviours and lack of mentalizing ability is associated with various maladaptive insecure behaviours (e.g. Fonagy et al., 2002; Fonagy et al., 2008). Thus, a control group of typically developed adults might be expected to exhibit the types of relationships associated with the general adult population for both mentalizing and emotion.

What is less clear is whether therapists will do the same, particularly given that they spend significant time habitually inhibiting their own emotional perspective in order to serve their clients well. There is some evidence that secure therapists can more easily put aside their own attachment representations in order to respond to client presentations appropriately without the risk of significant countertransference issues marring the relationship (Dozier, et al., 1994; Tyrell, Dozier, Teague & Fallot, 1999). Further, those that are more secure in attachment organisation make more flexible adjustments towards clients, modulating their responses so as to relate effectively to the individual client (Daly & Mallinckrodt, 2009). This tells us that secure attachment in therapists may be beneficial. It tells us less about therapists

with insecure attachment styles or whether therapists who have trained professionally (and undertaken their own therapy) experience a modification to the effect of attachment styles. It may be entirely plausible that, due to earned security on the part of the therapist, a different pattern might be expected e.g. the effect of attachment is diminished.

## 1.5. This Study

### 1.5.1. Participants

Participants were in two groups; first a group of 20 Counselling Psychologists, psychotherapists or counsellors (termed "therapists"). This group included practitioners professionally educated to Doctoral, Masters or equivalent level, all of whom had experience of at least 500 client hours, some significantly more. Therapists practised in various therapeutic models and were members or affiliated with one of the major psychotherapeutic professional bodies e.g. British Psychological Society (BPS), British Association for Counselling & Psychotherapy (BACP) or equivalent. The demographic characteristics and background of the therapists are detailed further in the Methods Section and in detail in Appendix 1.

The second group, the control group, comprised an equivalent number of non-therapists, educated also to postgraduate level, working in a variety of non-counselling related careers. Occupations were highly varied and included both helping professions such as teachers as well as more commercial careers such as accountants. The groups were designed to be matched for gender, age, socio-demographic characteristics, and general social and non-social abilities. It is considered that the control group in this study was constructed particularly rigorously so that the results with respect to mentalizing, attachment, and the relationship between the two represent real group differences rather than those which could exist as a result of spurious participant characteristics.

### 1.5.2.Measures.

To measure adult attachment, an extensively used self-report questionnaire, the Experience in Close Relationships (ECR; Brennan, Clark & Shaver, 1998) was used. A battery of measures was also chosen to tap mentalizing including self-report scales, behavioural measures and eye-tracking tasks. They are described throughout the text and are designed to assess several different aspects of mentalizing, e.g. social-perceptual, social-cognitive and empathic understanding. Overarching this was the intention to

measure the two more fundamental facets of mentalizing, namely mental state *comprehension* and the *production* of (or *proclivity to use*) mentalization capabilities.

The self-report measures for empathic understanding comprised the Empathy Quotient (Baron-Cohen & Wheelwright, 2004) and Interpersonal Reactivity Index (Davis, 1980). The behavioural tasks included a perspective taking task in which accuracy and reaction times were recorded (Keysar, et al., 2000), an emotion recognition task (Ekman & Friesen, 1971), and a complex mental state understanding task (the "Reading the Mind in the Eyes" task, Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001). More novel assessments of the proclivity to use mental state understanding through analysis of mental state talk were also utilised. These included a "pictures description" task (Ruffman, et al., 2002) and the Levels of Emotional Awareness Scale (Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990). Finally, eye-tracking data was collected to record where and for how long participants looked at socially or non-socially relevant stimuli. In summary, a comprehensive range of mentalizing measures was used, tapping both mental state comprehension and the proclivity to use it, as well as more subtle aspects of social orientation as measured by the eye-tracking, to give as full a picture as possible of how mentalizing ability may relate to and interact with attachment orientation.

### 1.5.3. Research Questions

#### 1.5.3.1. Are levels of security and insecurity comparable between therapists and non-therapists?

Despite the fact that therapists are required to act as the "secure base" in the therapeutic relationship, previous research suggests that the percentage of securely attached therapists in any group should be similar to the general population at 60-70% (Leiper & Casares, 2000; van Ijzendoorn & Bakermans-Kranenburg, 1996). Whilst differences in levels of attachment security between therapists and control group members were not the major focus of this study, attachment orientation of both were measured in order to explore the effect of attachment on mentalizing. However, it was not expected that therapists as a whole would be more secure than non-therapists.

1.5.3.2. Will therapists self-report greater mentalizing abilities than non-therapists?

Previous research suggests that therapists are better at some aspects of mentalizing than other people, for example, in emotion understanding, and in empathic ability (e.g. Hassenstab, et al., 2007) although this view is often arrived at via self-report measures (e.g. Hall, et al., 2000). The expectation was that the therapists would replicate previous studies and exhibit some aspects of self-reported mentalizing, such as empathic understanding, that were more advanced than the control group.

1.5.3.3. Will therapists show greater abilities in behavioural and experimental measures of mentalizing?

Existing literature does not allow an informed assessment of what to expect in other areas of mentalizing, for example, complex mental state understanding, perspective taking or in the production of mental state talk. This represents one of the key areas of research in this study. Given enhanced self-reported abilities in some areas of mentalizing, and the extent of the training that therapists have undergone in the understanding of emotional states presented by their clients, a superior performance by therapists might be expected in all or at least some of the more complex and subtle aspects of mental state comprehension and the proclivity to use mentalizing ability. The battery of behavioural tasks aimed at tapping both these aspects of mentalizing should allow a more considered exploration of these issues.

1.5.3.4. Will the relationship between attachment and mentalizing abilities be comparable in therapists and non-therapists?

There is some evidence that a greater mentalizing capability is correlated with secure attachment-related socially beneficial behaviours and that a lack of mentalizing ability is correlated significantly with various maladaptive insecure behaviours (e.g. Fraley & Shaver, 2000; Fonagy et al., 2002; Fonagy et al., 2008; Mikulincer & Shaver, 2007). Therefore, the control group of typically developed adults might be expected to exhibit the behaviours normally associated with attachment styles, for example, avoidantly attached individuals might retreat from emotional stimuli and be poorer at processing mental state information generally, and anxiously attached individuals might

exaggerate attachment-related information. What is less clear is that therapists will exhibit the same patterns, given their experience and training. It might be that therapists display a slightly different profile due to their experience in overcoming their own perspectives and immersion in the emotional experience of their clients. One possibility is that the effect of therapists' attachment orientation may not be as pronounced as that expected in the general population.

## 2. Attachment

In order to give a comprehensive background to attachment theory and the relevant concepts, the attachment literature is reviewed below, beginning with early infant and child attachment theory and research, before moving into the main area of concern for this study which is adult attachment theory and measurement.

### 2.1. Attachment: Mother and child

#### 2.1.1. Bowlby

Bowlby's (1969/82, 1973, 1980) attachment theory has become the leading theoretical framework in understanding the importance and development of attachment bonds and close social relationships in infancy, childhood and adulthood. Bowlby's theory is deeply rooted in several influential areas of theory and research, e.g. in primate ethology, developmental psychology, social psychology and psychotherapy. According to attachment theory, infants are born with an attachment system that allows the developing child to maintain proximity to and seek support from primary carers in times of stress and potential separation (Bowlby, 1969/82). If a child perceives an attachment figure to be available, safe and responsive in times of need, the child's attachment system functions optimally (Bowlby, 1973) and he or she will experience an inner sense of safety or "felt" security (Sroufe & Waters, 1977). This results in a perception that the world is a benign place, that others are sensitive and that the environment may be safely explored. However, if the child perceives a threat to the relationship in the form of inconsistency of care, or senses an absence of care entirely or even hostility on the part of the carer, the sense of security is undermined and he or she feels anxious or threatened (Bowlby, 1969/82). In such cases, secondary systems are developed by the child to manage the effects of the felt insecurity (Main, 1990; Shaver & Mikulincer, 2002a) and to try to maintain proximity to or distance from his or her carer (Bowlby, 1969/82).

### 2.1.2.Internal working models

According to Bowlby (1969/82, 1973), repeated interactions between the infant and parent lead the infant to develop expectations about the caregiving that he or she receives from the parent. These are organised into internal working models of the caregiver, the self and the relationship between the two (Bowlby 1973). Responsive and sensitive caregiving leads to the development of internal working models of the caregiver as trustworthy and supportive and to positive models of the self as worthy of support and safety. Conversely insensitive and unpredictable caregiving, goes hand in hand with models of caregivers as untrustworthy and unavailable, and of negative models of the self as not worthy of support and care. Negative models will also include self-doubt in close relationships and compensating maladaptive emotional responses as part of anxious or avoidant strategies for dealing with the associated psychological pain (Bowlby, 1969/82).

Thus, a child's early experience of the relationship between itself and the primary carer helps shape his or her general mental representations of the self and others which then remain relevant into later life. This influence occurs through the expectations that have been built up of others' emotional availability and beliefs about finding a secure personal base (Bowlby, 1979). In summary, a securely attached individual will expect others to be receptive and supportive, and an insecure individual will expect others to be indifferent or rejecting (Mikulincer & Shaver, 2007a; Shaver & Mikulincer, 2002a).

### 2.1.3.Maternal influence

Many developmental psychologists (e.g. Ainsworth, Bell & Stayton, 1974; Meins, et al., 2001; Fonagy & Target, 1997) and psychotherapeutic theorists (e.g. Bion, 1962; Kohut, 1977; Winnicott, 1965) have recognised that the sensitivity provided by the main caregiver is fundamental in the development of the child's sense of security.

#### 2.1.3.1. Maternal sensitivity

The pivotal work of Mary Ainsworth and colleagues in the Strange Situation paradigm (Ainsworth, Blehar, Waters & Wall, 1978) provided the first empirical evidence to support Bowlby's concept that differences in maternal sensitivity may be related to differences in infant-mother attachment security (Ainsworth, Bell & Stayton, 1971, Ainsworth et al., 1974). Infants classified as

secure in the Strange Situation typically react to separation from their mothers with observable signs of distress, but they recover quickly when back with their mothers whom they greet with joy and affection, soon returning to explore their environment. Insecurely attached infants, dependant on their classification, either show little distress at separation and an avoidant reunion, or cry and protest angrily at separation and are hyper-aroused at reunion (Ainsworth et al. 1978).

Ainsworth et al., (1971, 1974) found that higher maternal sensitivity scores were related to more accessibility between mother and child, greater acceptance and cooperation, and to secure attachment relationships at 12 months. Conversely, consistent rejection of infants or inconsistent care was related to an insecure pattern of attachment. Subsequent research has supported this, although recent commentators conclude that it is arguably too simplistic to consider sensitivity as the only or most significant factor in the development of a secure attachment orientation (e.g. Meins et al., 2001).

#### 2.1.3.2. Maternal responsiveness and appropriateness

Importantly, the concept of parental sensitivity has been explored and developed further. Parental sensitivity seems not just about responsiveness per se but also about appropriateness, requiring parents to be able to read the cues of their infants (Meins, et al., 2001). Such an ability necessitates parents treating their infants as individuals with minds (Meins, 1997), a capability that has been linked to various characteristics in pre-schoolers. For example, a mother's tendency to focus on mental states rather than behavioural or physical states when describing her child, in particular her proclivity to use *appropriate* mind-related comments towards her infant, predicts better mentalizing capabilities in the child (Meins, Fernyhough, Russell & Clark-Carter, 1998) and security of attachment at 12 months (Meins et al. 2001). It appears therefore that mothers of securely attached children possess better mentalizing capabilities. Further studies corroborate that maternal sensitivity, attachment and maternal use of mind-related comments are all inter-related and suggest that the latter is a prerequisite for maternal sensitivity (Laranjo, Bernier & Meins, 2008).

Thus, responsiveness and appropriateness of a mother's mind-related talk may be seen as a refinement of and much closer to Ainsworth et al.'s (1971, 1974) original construct of maternal sensitivity. Moreover, Meins (1999), using the internal working model approach, also suggests that mothers' representations of and discourse about their infants' mental and emotional states may provide a mechanism for the link between parental security of attachment and a secure infant-parent relationship.

#### 2.1.3.3. Maternal Reflective Function

Fonagy and colleagues (Fonagy, Steele, Moran, Steele & Higgitt, 1991; Fonagy & Target, 1997) have attempted to explore further what allows mothers to show responsive and appropriate caregiving. They introduced the concept of "Reflective Function" defined as the mental function which organises the experience of one's own and others' behaviour in terms of mental state constructs and represents the knowledge of the nature of experiences that give rise to certain beliefs and emotions (Fonagy, et al., 2002). It is suggested that reflective function is an important determinant of individual differences in self-organisation and the continuity of self-experience which in turn is the underpinning of a coherent self-structure.

Maternal reflective function allows the child to begin to interrogate what he feels about the mental states he encounters. A process of representational mapping facilitates the development of reflective abilities (Target & Fonagy, 1996). When the mother reflects or mirrors an emotion using her own reflective functioning, it is represented by the child and mapped onto the representation of his self-state. Any discrepancy providing not too close to or too remote from the child's self-representation is used as a tool for self-organisation and affect regulation. Thus, a mother uses her own mentalizing capability to enhance the child's and the attachment system is intimately connected with both representational mapping and the development of the reflective function in the child.

In many respects, the mirroring and reflection of emotion termed by Fonagy as reflective functioning is very similar to earlier psychodynamic constructs of the relationship between mother and child (Fonagy, 2001). An example might be Bion's notion of a mother's capacity to contain and reflect back a more tolerable version of unmanageable feelings (Bion, 1962). Similarly

Winnicott (1965), envisaged the ideal mother as being sensitive to both her own and her baby's feelings. Her accurate responses to her baby were particularly important both in terms of soothing and containing his distress and in facilitating a separateness (Winnicott, 1962). This would lead to a genuine relationship and contribute to the strength of the child's sense of self which was seen by Winnicott therefore as directly determined by the reflective function of the mother.

Slade (2005) sees parental reflective functioning as an overt manifestation, in narrative, of mentalizing capacity and also found a strong association between infant attachment and the quality of the parent's reflective functioning using an autobiographical memory based interview about the child (Slade, Grienenberger, Bernbach, Levy & Locker, 2005). High scorers on this interview were aware of their infant's mental functioning and grasped the relationship between their own mental states and their children's experience. Low scorers were more likely to evidence atypical maternal behaviour, infant disorganised attachment and unresolved maternal attachment issues. Reflective functioning mediated some of the effect of adult attachment on infant attachment.

Taken together these results suggest that the mentalizing style of the parent may facilitate the development of mentalization (e.g. Target & Fonagy, 1996) and also security of attachment in the child (e.g. Meins et al., 2001). Drawing a parallel between infant-mother attachment dynamics and those of the client-therapist dyad (Bowlby, 1988) it seems that the responsiveness and sensitivity of the therapist as an attachment figure is particularly important. Moreover, the therapist's ability to use his or her mentalizing capacity in order to act as the "secure base" for the client seems especially important. However, there are elements of the therapist/client association that do not parallel the mother/child relationship. In particular the mother's attachment orientation might be expected to have a direct and relatively clear effect on her ability to mentalize and to offer responsive and appropriate care. For example, an avoidant mother may struggle with emotional intimacy with her child, or an anxiously attached mother might display exaggerated emotional responses to a threatening situation. However, in therapists, the effect of attachment style may be more complicated and potentially altered by the influences of training and experience. In particular one might anticipate seeing this in the proclivity to use mentalization capacity. One of the aims of this study, therefore, was to analyse therapists' mental state talk, an exercise which was designed to assess the proclivity to use mentalization capacity, and is particularly analogous to the measures used

in the above studies concerning mothers' mental state talk (e.g. Laranjo et al., 2008; Meins et al., 2001).

### 2.1.4. Attachment outcomes in childhood

According to Bowlby, there is a strong causal relationship between a child's parental attachment experiences and those later constructed with other individuals (Bowlby, 1979), for example, siblings, friends and partners. This link, according to Bowlby, is due to the child's relatively stable internal working models (Bowlby, 1969/82, 1973). Early interactions between child and parent provide the template not only for forecasting a caregiver's responsiveness but also from which the child learns the fundamental rules and expectations of relating to others such as reciprocity and communication (Weinfield, Sroufe, Egeland & Carlson, 2008). Intra-personal qualities such as confidence, self-esteem and social skills that foster satisfaction in interpersonal relationships are also influenced (Sroufe, Egeland, Carlson & Collins, 2005).

In support of this, empirical studies have shown that attachment styles are predictively associated with many inter-personal and social behaviours in childhood. For example, securely attached children have more constructive patterns of communication and problem-solving with parents (e.g. Frankel & Bates, 1990; Slade, 1987) and peers (Raikes & Thompson, 2008), possess more extensive and supportive social networks, both actual and perceived (Anan & Barnett, 1999; Bost, Vaughn, Washington, Cielinski & Bradbard, 1998), experience greater levels of self-esteem and self-confidence (Sroufe et al., 2005) and less loneliness (Raikes & Thompson, 2008). They are stronger in emotion regulation (Thompson & Meyer, 2007), rely more on constructive methods of managing distress (Gilliom, Shaw, Beck, Schonberg & Lukon, 2002) and cope more effectively with stress (Contreras, Kerns, Weimer, Gentzler, & Tomich, 2000).

Further, in terms of emotion understanding, it has been shown that securely attached children possess an enhanced ability in understanding emotion (Laible & Thompson, 1998; Ontai & Thompson, 2002; Raikes & Thompson, 2006), possess a more advanced understanding of the mental states of their mothers (Repacholi & Trapolini, 2004) and exhibit a better memory for attachment-related emotional information (Kirsh & Cassidy, 1997). In sum, securely attached children appear to possess a higher degree of social skills including social-cognitive abilities, leading to the development and maintenance of comparatively successful close relationships (see Thompson, 2008 for a review of theoretical and empirical research findings).

### 2.1.5. Stability and change in attachment through childhood

Empirical studies using the Ainsworth Strange Situation paradigm (Ainsworth et al., 1971, 1978) have suggested the relative stability of attachment classifications between the ages of 12 and 18 months (e.g. Vaughn, Egeland, Sroufe, & Waters, 1979; Waters, Merrick, Treboux, Crowell & Albersheim, 2000). However, Bowlby's theory arguably predicts both stability and change (Vaughn et al., 1979). The relative stability of internal working models was noted by Bowlby (1969/82), but he stressed that a continuous secure attachment required the child's internal working model to be updated with developing communicative and cognitive competencies and in line with the relevant changes in interactions with parents and other carers (Bowlby, 1980, 1988). Major changes in the child's environment or experiences such as trauma and loss directly influence the quality of child-parent relationships and require the alteration and reformulation of internal working models. These might include death or severe illness of a parent, divorce, drug or alcohol abuse in the parent or abuse of the child (Bowlby 1953). Longitudinal studies of attachment through childhood show that, where changes in attachment classification occur, such experiences may play a key role (Crowell, Treboux, & Waters, 2002; Vaughn, et al., 1979; Waters, 1978; Waters et al., 2000). For example in one study, where mothers reported none of the life events identified by Bowlby, attachment classifications into young adulthood changed in only 15% of cases, but where one or more events were reported, the likelihood of a secure infant becoming insecure was 66.6% (Waters et al.,2000).

In summary, there seems to be evidence that attachment styles based on internal working models are relatively stable. However, exploring the circumstances of change and potential for modification in internal working models is important for understanding the extent to which early attachments influence other relationships and the limits of this influence (Berlin, Cassidy, & Appleyard, 2008). This seems particularly important for those engaged in therapy, both therapist and client. Skilful therapists build a therapeutic relationship providing a secure base and safe haven for clients. This begins to provide a corrective emotional experience through which the client can rely on more secure strategies to manage emotion, develop social skills, and to form satisfying attachments with others (Mallinckrodt, 2001). The potential for change in internal working models of attachment and attachment-related behaviours is therefore clearly linked to the ability of the therapist to provide a corrective emotional experience (Bowlby, 1988). It is suggested here that this is closely related to the both the therapist's ability to mentalize which in turn may or may not be influenced by his or her own attachment orientation.

## 2.2. Attachment in adulthood

### 2.2.1. Linking child and adult attachment theoretically.

Predicated on the concept of the relative stability of the internal working model, Bowlby believed attachment relationships continue to play a powerful role in adulthood through the formation, maintenance and disruption of attachment bonds (Bowlby, 1980). Ainsworth (1991) also highlighted the function of the attachment behavioural system in adult relationships, particularly emphasising the secure base phenomenon as the critical element. These concepts began to be developed further into an alternative theoretical approach by social scientists interested in the idea of individual differences in attachment and how these were manifested in adult close relationships (Hazan & Shaver 1987; Shaver & Hazan, 1988; Shaver, Hazan & Bradshaw, 1988). This matured into a conceptualisation of adult bonding in close relationships as an attachment process, following the same sequence of steps as infant-carer attachment, i.e. proximity seeking, safe haven and finally as secure base (Hazan & Shaver, 1994; Heffernan, Fraley, Vicary & Brumbaugh, 2012).

The secure attachment relationship in adulthood thus continues to be characterised by the use of the attachment figure as a secure base from which to explore the world and a safe haven in times of distress (Ainsworth, 1989, 1991; Bowlby, 1969/82). Research has also demonstrated the experience of anxiety, loneliness and restlessness when separated (Weiss, 1973, 1991), a feeling of security when attachment figures are accessible (Shaver et al., 1988; Weiss, 1991), and engaging in a special spoken communication, specific to that relationship (Shaver et al., 1988). This develops still further as romantic partners begin to serve as a base from which to explore newer environments and activities such as career paths and leisure pursuits (Hazan & Zeifman, 1999). Thus, in terms of both theoretical link and empirical evidence, adult attachment bonds may be conceptualised in very similar ways to infant and childhood attachment.

### 2.2.2. Measuring attachment in adulthood.

The study of adult attachment has focussed largely on individual differences rather than on normative developmental aspects of the attachment system. A wealth of adult attachment measures have been developed since Bowlby's original work which, for the most part, conceptualise attachment patterns in terms of classifications of individuals into categories of secure or insecure attachment. Some originated from the developmental or clinical school of attachment research, for example, the Adult Attachment Interview

(George, Kaplan & Main, 1985, 1996; Main, Kaplan & Cassidy, 1985), and some were developed by those more interested in individual differences and social psychology, for example, the Adult Romantic Attachment measure (Hazan & Shaver, 1987), the Adult Attachment Scale (Collins & Read, 1990), the Relationship Scales Questionnaire (Bartholomew & Horowitz, 1991) and the Experiences in Close Relationships (Brennan et al., 1998).

#### 2.2.2.1. The Adult Attachment Interview (AAI)

The AAI (George et al., 1985, 1996; Main, et al., 1985) is a semi-structured interview in which adults are asked to narrate or describe their early experiences with attachment figures. It classifies individuals into categories: adults in the secure (referred to as autonomous) category give coherent and fluent narratives of their childhood experiences, showing both reflection and resolution of difficulties. Conversely, adults who are highly avoidant (dismissing) tend to belittle their childhood by denigrating or denying the importance of childhood memories, and highly anxiously attached (preoccupied) adults tend to still be overwhelmed or over-involved with experiences. However, individuals are assigned to a category of attachment based not on the content of what is said but on the basis of the coherence of the individual's discourse which is taken to indicate his or her defensive attachment strategies. Main et al. (1985) reported that mothers who are classified autonomous on the AAI are more likely to have secure attachment relationships with their infants, a pattern replicated in fathers by Steele, Steele and Fonagy (1996) and confirmed by van IJzendoorn's (1995) meta-analysis.

Although the AAI has been a widely used instrument, some concerns with it do exist. It yields a global measure of attachment security or classification of coherence, which seems to lose some of the complexity of the narrative and it does not discriminate between the internal working model of the self with parent, and the model of self with child, an important nuance. Moreover, the manual for scoring is highly complicated and unpublished, requiring extensive training and is expensive.

#### 2.2.2.2. The Experiences in Close Relationships (ECR)

Whilst the AAI focusses on attachment categories, more recent research has focused on patterns of interpersonal behaviour relating to two dimensions: avoidance and anxiety (Brennan et al., 1998), these appearing sufficient to describe adequately all presentations of adult attachment (Crittenden, 1997; Fraley & Waller, 1998; Mikulincer, Shaver & Pereg, 2003). As reflected in original attachment theory, avoidance describes a distrust of a partners' availability and responsiveness, habitual self-reliance through fear of dependency or intimacy, and an inclination towards emotional distance from others. Conversely, attachment anxiety is defined by a lack of felt security that a partner will be available if needed, a strong requirement for closeness, significant worries about intimate relationships and an acute fear of rejection or abandonment. If both avoidance and anxious dimensions are low, a secure attachment orientation exists (Brennan et al., 1998; Lopez & Brennan, 2000; Mallinckrodt, 2000). The dimensions of avoidance and anxiety can be conceptualised also in terms of the secondary maladaptive attachment strategies designed to defend against the frustration and pain of inconsistent or absent care (Main, 1990; Shaver & Mikulincer, 2002a).

The attachment measure used in this study was the Experiences in Close Relationships (ECR, Brennan, at al., 1998), one of the most commonly used self-report measures of adult attachment (Crowell, Fraley & Shaver, 2008). Based on the two relatively orthogonal factors of avoidance and anxiety, the ECR is designed to focus on adult relationships and assesses trait-like (or global) patterns of adult attachment as independently as possible from idiosyncratic influences of respondents' current circumstances. The instructions include the words, "We are interested in how you generally experience relationships, not just in what is happening in a current relationship". Results of Item Response Theory analysis have shown that a good degree of measurement precision is afforded by the ECR in comparison with other self-report inventories (Fraley, Waller & Brennan, 2000). The ECR produces coefficients for both avoidance and anxious dimensions and although categories of attachment can be also be generated, recent research prefers the dimensional approach, a view also taken in this study.

#### 2.2.2.3. Comparison and debate: the AAI vs. the ECR

Despite the theoretical link between infant and adult attachment, there has been much debate about the appropriateness and relative qualities of current adult attachment measures. In a review, Shaver and Mikulincer (2002a,b) note the lack of communication and cross-fertilisation between two paradigms of attachment research: a developmental and clinical framework utilising observational and interview techniques such as the AAI (e.g. Ainsworth et al., 1978; Main et al., 1985) versus a social research conceptualisation applying Bowlby's original theory to adult close relationships using self-report measures (e.g. Hazan & Shaver, 1987), such as the ECR. Whilst the former instruments are designed to measure working models of and responses to early childhood experience, the latter are designed to access attachment-related feelings and behaviours in adult relationships. Proponents for the AAI suggest that it provides a window into attachment-related unconscious processes which self-report measures do not. Conversely, those who use self-report measures view them as assessments of cognitions, emotions and behaviours which are themselves indicators of the deeper unconscious.

Although both paradigms conceptualise attachment in terms of Bowlby's original theory, researchers have found only modest associations between the two (Shaver, Belsky & Brennan, 2000). Self-report measures differ in a number of ways from the AAI (George et al., 1985) and the outcomes can diverge quite significantly. In a reply to Shaver and Mikulincer (2002a), Waters, Crowell, Elliott, Corcoran and Treboux (2002) undertook a comparison of a number of measures. They found several correlations between the AAI and structured narrative tasks or naturalistic observations, but few significant correlations between the AAI and self-report measures. For Shaver and Mikulincer (2002b) however, a lack of relationship between AAI and self- report measures does not mean that self-report measures do not have construct validity and they recommend that, "If the focus is on relationship-related emotions….especially as experienced and reported by the person him- or herself…" then the use of self-report measures, for example the ECR, is preferable (Crowell et al., 2008, p624).

### 2.2.3. Stability and change in attachment though adulthood

Another debate is concerned with the stability of attachment orientations and the conceptualisation of attachment as a style or a trait. Original attachment theory would suggest that the attachment system continues to influence behaviour through thoughts and feelings in adulthood, somewhat regardless of general experience or the specifics of intimate relationships (Hazan & Zeifman, 1999; although note Bowlby's assertions on the potential for change in internal working models through trauma and loss, Bowlby, 1953, 1980, 1988).

Mikulincer and Shaver (2005) suggest that modes of coping with attachment-related threats are associated with unique personal goals. For example, securely attached individuals focus on the development of appropriate closeness in their relationships, anxiously attached individuals strive to achieve enhanced intimacy, and avoidantly attached individuals try to maintain personal autonomy and control. Such strategies may logically suggest that attachment styles early in life will be maintained and reinforced largely unchanged into later life, particularly for secure individuals. Researchers have suggested a framework of relational schemas, models or scripts, which are held and accessed in situations of attachment relevance. For example, the "secure based script" (Waters & Waters, 2006) includes a number of components, namely (i) if a challenge brings distress, a partner can be approached for help, (ii) the partner will be available and supportive when asked for help, and (iii) proximity to the partner brings relief and comfort. According to Mikulincer and Shaver (2007b), regular activation of the secure-based script guides a broaden-and-build cycle of attachment security, making it less necessary to rely on psychological defences that distort perception and limit coping. This ensures emotional closeness, intimacy, optimism and relationship satisfaction.

However, Waters et al. (2002) have also warned of a tendency to lapse into broad characterisations of individuals as secure, anxious, or avoidant. Individuals may maintain multiple working models of attachment which run concurrently and hierarchically through different kinds of attachment relationship (e.g. infant-parent, romantic, friendship) towards generic representations (Bretherton & Munholland, 1999). Neither the AAI nor self-report measures have adequately distinguished between relationship-specific or more generalised profiles of behaviour, although the ECR, for example, encourages participants to consider how they behave generally in relationships. In addition, self-report measures reliably give significant theory-consistent findings, suggesting that some kind of generic level of measurement is psychologically meaningful (Shaver & Mikulincer, 2002b).

There is evidence for profound relationships between infant attachment, quality of adolescent relationships and adult security (e.g. Simpson, Collins, Tran & Haydon, 2007). Nevertheless, the profile progression is not necessarily straightforward and attachment representations may be modified continuously during successive attachment relationships (Carlson, Sroufe & Egeland, 2004). For example, non-familial relationships, e.g. with teachers or peers, have been found to mediate a correlation between attachment in early and later life. Such mediation has been partial, however, with the impact of early attachment styles remaining a significant predictor of later behaviour (Sroufe et al., 2005). A number of other longitudinal studies of associations between early attachment experiences and adult attachment orientations have been inconclusive, and suggest a modest relationship at best (Crowell, Fraley & Shaver, 1999; Levy, Blatt & Shaver, 1998; Steele, Waters, Crowell & Treboux, 1998).

In adulthood, the continuity of attachment styles is partially supported by longitudinal studies using self-report measures. For example, Kirkpatrick and Hazan (1994) found 70% continuity in attachment styles over four years in adults and Davila, Burge and Hammen (1997) noted a similar degree of continuity in adolescents. In an extension of the latter study, however, Lopez and Gormley (2002) used the ECR to study stability of attachment orientations and found 57% attachment stability in first year college students during a time of emotional and practical change, which the authors describe as, '…only moderately stable…' (p361). Research on this issue is therefore equivocal and linked to circumstances under which internal working models change (Berlin et al., 2008) including the effect of corrective attachment-like relationships (Bowlby, 1988).

### 2.2.4.Attachment outcomes in adulthood

#### 2.2.4.1. General

Adult attachment style has been found to be predictive of general functioning and relationship experiences, and self-report measures have been instrumental in the analysis of this. Bowlby suggested (Bowlby, 1969/82, 1973) that adults with a secure attachment history will have found that maintaining proximity to attachment figures results in protection, support and relief of distress, and that they will likely follow a "secure based script": expression and acknowledgement of distress, participation in problem solving, and ability to

engage in support seeking (Waters, Rodrigues & Ridgeway, 1998; Waters & Waters, 2006). Secure individuals tend to describe their relationships as happy, trusting and friendly (Hazan & Shaver, 1990). Furthermore, they consistently hold more optimistic views about their ability to cope with stressful events (e.g. Berant et al., 2001; Mikulincer & Florian, 1995), acknowledge and display emotions (e.g. Mikulincer & Orbach, 1995), disclose personal information openly (e.g. Collins & Read, 1990; Mikulincer & Nachshon, 1991) and are inclined to seek support in regulating affect in distressing situations (e.g. Ognibene & Collins, 1998). They do not tend to worry about work or allow it to interfere with friendships or health (Hazan & Shaver, 1990).

Conversely, anxiously attached individuals tend to focus on their own distress and ruminate on negative thoughts (Mikulincer & Florian, 1995), experience a greater degree of worry, including death anxiety (Mikulincer, et al., 2002), are prone to anger (Mikulincer, 1998), and to self-devaluation (Mikulincer, et al., 1998). Those high in avoidance distance themselves from emotional bonds with others (Fraley & Davis, 1997) and from distress (Mikulincer & Florian, 1995), are less likely to turn to others for support and care (Simpson et al., 1992), avoid accessing distressing memories (Mikulincer & Orbach, 1995), and tend to experience paranoia and hostile attitudes (Mikulincer, 1998), including the defensive projection onto others of their own unwanted traits (Mikulincer & Horesh, 1999). Avoidant individuals also exhibit high levels of distress and maladjustment in persistently stressful situations (Mikulincer & Florian, 1998).

#### 2.2.4.2. Social emotional information processing

##### 2.2.4.2.1. Theoretical framework

Internal working models of attachment are thought to influence not only the way people behave but also the way in which they perceive, attend to and process information of emotional significance (Mikulincer & Shaver, 2003, 2007). Self-report questionnaires have been extensively used in studies concerning the defensive attachment strategies of hyperactivation and deactivation (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2007a; Shaver & Mikulincer, 2002a). A central assumption of the hyperactivation/deactivation affect regulation model

(Mikulincer & Shaver, 2003) is that cognitive processes play a role in appraising and monitoring the environment for cues regarding the proximity and accessibility of significant others (Fraley & Shaver, 2000).

When, due to threat, the attachment system is activated, historical attachment expectations come in to play. If individuals expect others to be available and responsive, they use secure-based strategies to seek comfort, proximity and support. Conversely, if individuals expect an environment lacking in response, they become distressed, and engage in one of two strategies; avoidant individuals attempt to deactivate the attachment system's needs for proximity and protection by ignoring or dismissing significant and stressful attachment-related events such as rejection or criticism and by suppressing related emotion. Conversely, anxiously attached individuals employ hyper-activating strategies, and attempt to maintain proximity at any cost. They generate and intensify negative emotional states and distress-evoking stimuli which maintain the individual's attachment system in a chronically activated state. Thus, insecure attachment styles are associated with biased processing of incoming information to conform with the individual's attachment expectations and is designed to increase (in anxiety) or decrease (in avoidance) emotional response.

2.2.4.2.2. Empirical evidence in children

In pre-school children, secure attachment predicts higher emotion understanding (Laible & Thompson, 1998; Ontai & Thompson, 2002; Steele, Steele, Croft & Fonagy, 1999), the effect being greater in older children (aged around 5) rather than in younger children whose conceptions of emotions are more limited (Ontai & Thompson, 2002). Similarly in longitudinal studies, children's attachment security at a year old has been found to be predictive of an enhanced understanding of emotions at six years (Steele, et al., 1999). In terms of emotion processing, Kirsh and Cassidy (1997) found avoidantly attached children looked away from mother-child dyad pictures more than other children, suggesting an exclusion from awareness and avoidance of processing any potentially distressing attachment material, arguably in a strategy to minimise the need for care from another.

Greater emotion understanding in securely attached children applies particularly in the context of maternal use of elaborative discourse (Ontai & Thompson, 2002). An open discourse relating to attachment issues in secure mother/child dyads is thought to foster an experience of emotion within a safe and supportive environment and enables children to understand it more coherently (Bretherton, 1990). This in turn positively influences the child's internal working models (Bowlby, 1969/82; Bretherton, 1990a; Bretherton & Munholland, 1999). Secure attachment appears to allow negative emotions to be shared, explored and comprehended just as openly as positive examples (Laible & Thompson, 1998; Ontai & Thompson, 2002). Conversely, insecure attachment relationships are characterised by limited emotional sharing, particularly of negative or threatening emotions, which results in defensive exclusion of such emotions from conversations (Bretherton, 1990b, 1991; Bretherton & Munholland, 1999).

In sum, for children, attachment status and socio-emotional processing are clearly associated, and moderated by maternal use of mentalizing discourse. Such discourse in the context of a secure relationship provides a productive and effective opportunity for developing emotion understanding as representational capacities mature (see Thompson, Laible & Ontai, 2003 for a review). However, less is known about these associations in adults.

2.2.4.2.3. Empirical evidence in adults

Avoidant individuals have been found to have difficulty recalling attachment-related experiences (Mikulincer & Orbach, 1995). There is an indication that these memory deficits stem from processes occurring when information is attended to or encoded because rehearsal and elaboration when prompted after encoding seems to be the same for avoidant and non-avoidant individuals (Fraley, Garner & Shaver, 2000). Avoidance has similarly been associated with lower working memory capacity for attachment-related words, but not for neutral words, suggesting a selective restriction of attention to attachment-related material (Edelstein, 2006).

Edelstein and Gillath (2008) went on to find an association between avoidance and stroop interference for attachment-related words, particularly in individuals currently in a romantic relationship. They suggest that a current relationship may trigger the defensive strategy of deactivation of the attachment system. They also suggest that those in a relationship have more experience and proficiency in using defensive strategies to regulate emotion. Because bias was seen in situations where the cognitive load was particularly high, Edelstein and Gillath suggest that avoidance of stimuli is not automatic and cognitive effort is employed. In other words, avoidant individuals can and do inhibit attention to potentially threatening attachment information. They appear to quickly identify potential sources of threat at a perceptual level which allows them to inhibit attention accordingly. Again, the stroop effect was limited to attachment-related words, demonstrating the specificity of attachment attentional biases.

Edelstein and Gillath's findings correspond with Fraley and Brumbaugh's (2007) views on when avoidant individuals' minimisation of attachment-related experiences and corresponding exclusion of relevant information takes place. They suggest that the avoidant individual is characterised by the defensive pre-emptive exclusion of material at encoding rather than at retrieval in an attempt to minimise vulnerability as early as possible. In other words, unwanted affective information is not even encoded or represented in the memory system so that the attachment system remains inactivated and no potential undermining of self-reliance is risked. This conclusion challenges a common view of avoidant individuals as emotionally vulnerable (e.g. Dozier & Kobak, 1992), and suggests they may be far less emotionally fragile than has been assumed. It should also be noted that in two dimensional models of attachment, the degree to which an individual is avoidant is theoretically independent of his or her attachment-related anxiety. Thus, the behavioural patterns of avoidant individuals can be complicated by an additional fear of abandonment (fearful avoidance, i.e. high in both avoidance and anxiety; Bartholomew, 1990) which may contribute to an inability to use attachment defences as successfully as purely avoidant individuals.

Relationships have also been found between adult attachment and the automatic processing of facial emotion. Niedenthal, Brauer, Robin and Innes-Ker (2002) found a difference in timing of recognition of facial emotion offset dependent upon security of attachment and situation. Extending this from categories to dimensions, Fraley, Niedenthal, Marks, Brumbaugh and Vicary (2006) found anxiously attached participants judged the onset and offset of both negative and positive emotion more quickly than less anxious individuals again reflecting a vigilance in processing social cues at a basic perceptual level. This heightened vigilance appears to have complicated effects, though; it allows anxious people to be more sensitive to emotional changes but in this particular study it also led them to make more errors. More recently, in a study of attentional inhibition, Dewitte (2011) found attachment avoidance, but not anxiety, was associated with valence specific stimuli; avoidant participants exhibited a stronger inhibition of negative emotional material (both angry and sad faces) but not positive emotional stimuli. Dewitte argues for inhibitory processing in avoidant individuals as an early attentional mechanism that operates before the emotion-response tendencies have become activated.

In sum, it seems that there are clear attachment influences on the understanding and processing of emotion, with anxious individuals employing hypervigilence in reacting to emotional stimuli, albeit not always with accurate results, and avoidantly attached individuals inhibiting or excluding affect related information from processing.

2.2.4.2.4. Imaging studies of attachment and emotion understanding

Imaging studies have supported the above findings. In an emotion understanding study, Zilber, Goldstein and Mikulincer (2007) found fMRI scans showed anxious individuals evidenced more neural activation in regions of the brain associated with emotion processing, and less activation in areas of emotion regulation. Late positive potential (LLP) correlates also showed corresponding increased vigilance in anxiously attached individuals. Conversely avoidant individuals showed greater activity in areas associated with emotion suppression. More recently this was confirmed in an ERP study (Chavis

& Kisley, 2012) in which avoidant individuals displayed stronger neural activation in response to negative versus positive emotional images, whereas anxious individuals trended in the opposite direction. Taken together, therefore, both behavioural and imaging studies have shown a clear pattern of attachment bias in the processing of emotion.

#### 2.2.4.2.5. Attachment and more complex mental state understanding

Given the emotional processing biases detailed above, it might be expected that similar attachment-related biases exist in more complex mental state processing, but the evidence for this is limited. Associations between attachment security and mental state understanding in children have been found (e.g. Fonagy et al., 1997; Meins et al., 1998; Steele et al., 1999), yet others have failed to find independent associations between attachment and scores on mentalization measures when other variables such as the quality of mother-child discourse is taken into account (e.g. Meins et al., 2002; Ontai & Thompson, 2008). Similar studies in adults have so far not been undertaken. As discussed, therefore, one of the aims of this study was to begin to contribute empirical evidence for the associations between adult attachment and mentalizing capabilities, both in general terms and also in a specialised group.

## 2.3. Attachment in psychotherapy

### 2.3.1. Client attachment.

The perceived importance of attachment in the field of psychotherapy has grown significantly in the past 20 years (see, for example, Slade, 2008 for a comprehensive review). Indeed it was Bowlby who developed attachment theory originally for use in the diagnosis and treatment of emotionally disturbed patients and families and who first conceptualised the role of the therapist as analogous to that of a mother providing her child with a secure base from which to explore the world (Bowlby, 1988). The attachment-related defence strategies consistent with an insecure attachment orientation may well have provided the prospective client with protection from attachment-related threat or pain, but ultimately may confound a search for happiness in future relationships, ultimately bringing the client to psychotherapy.

The dynamics of psychotherapy have therefore often been framed as analogous to a repairing of the attachment relationship (e.g. Bowlby, 1988; Eagle, 2003; Fonagy, 2001; again, see Slade, 2008 for review of theory and research). An emotionally intimate relationship with a benign and trustworthy attachment figure, i.e. the therapist, can afford the chance to explore, reflect and express, free from anxiety and within a new safe, secure and healing therapeutic experience (Slade, 2008). The therapist's role is that of deconstructing the attachment patterns of the past and constructing new ones in the present (Wallin, 2007). Evidence suggests that to the extent that clients experience a therapist as an available safe haven and secure base, they are likely to engage more fully and successfully in therapy (Parish & Eagle, 2003). Not surprisingly, therefore, research suggests that therapists become very significant to their clients (Slade, 2008) and psychotherapy relationships can exhibit all the elements of attachment bonds. For example, some clients regard their therapists as stronger and wiser, seek proximity through emotional connection and regular meeting, rely on their therapist as a safe haven when threatened, derive a sense of felt security from their therapist, and experience separation anxiety when anticipating breaks, or therapy ending (Mallinckrodt, 2010).

Evidence suggests that secure clients are more comfortable seeking and making use of therapy (Dozier 1990; Dozier, Lomax, Tyrell & Lee, 2001; Riggs, Jacobvitz & Hazen, 2002), that secure attachment facilitates a more positive working alliance (Kivlighan, Patton & Foote, 1998; Mallinckrodt, Coble & Gantt, 1995; Satterfield & Lyddon, 1995) and that for insecurely attached clients working alliances differ markedly in their progression dependent upon whether the client's insecurity stems from attachment-related anxiety or avoidance (Eames & Roth, 2000; Kanninen, Salo & Punamaki, 2000). Client attachment orientation also appears to predict whether therapists respond with cognitive interpretation or affective reflection, the former more usual with avoidant clients, the latter more typical with anxious clients, (Hardy, Aldridge, Davidson, Rowe, Reilly & Shapiro, 1999; Rubino et al., 2000).

A number of research groups have developed measures to assess the attachment of the client to the therapist (Diamond, Stovall-McClough, Clarkin, & Levy, 2003; Mallinckrodt, Gantt & Coble, 1995; Parish & Eagle, 2003). The secure client will develop a secure attachment bond, as originally envisaged by Bowlby, using the therapeutic space to negotiate and change some insecure working models and to make sense of incomprehensible and difficult feelings in an intimate relationship. By contrast, insecurely attached clients appear more likely to form insecure attachments with their therapists, often seeing their therapist in an unreliable or untrustworthy light due to pre-existing internal models (Diamond at al., 2003; Hamilton, 1987; Slade 2004).

To date, only a few studies have considered whether client attachment status can be changed through therapy. The results seem mixed although there is some evidence that clients can move towards a secure organisation after treatment. This has been found in research with borderline personality disorder (BPD) patients (Fonagy, Steele, Steele, Leigh, Kennedy, Mattoon et al, 1995) and in time-limited therapy (Travis, Binder, Bliwise & Horne-Moyer, 2001). However, in the latter case this was true for patients with lower levels of symptomology and in the case of borderline patients, less obvious patterns of change have been found e.g. insecure to insecure (Diamond, Clarkin, Levine, Levy, Foelsch & Yeomans, 1999).

There is some evidence that avoidant clients are likely to experience a better outcome through therapy than anxiously attached clients (Fonagy, Leigh, Steele, Steele, Kennedy, Mattoon et al., 1996; McBride, Atkinson, Quilty & Bagby, 2006), possibly because therapy exposes avoidant clients to their emotions as a positive change, whereas anxious clients are already highly aware of their emotionality (Fonagy et al., 1996). This raises the question as to whether certain modalities of treatment serve certain client attachment orientations more successfully. Mikulincer and Shaver's (2007) affect hyperactivation /deactivation model is of relevance here also and there is conflicting empirical evidence; avoidant clients have been found to respond better to psychodynamic therapy (Fonagy et al., 1996) but also to CBT (McBride et al., 2006). Daniel (2006) suggests a strategy of employing a deactivating, more cognitive treatment plan for anxious clients who require the containment and organisation of overwhelming feelings, and hyper-activating, exploratory treatments for dismissing clients who may require more attuning to emotion (see also Holmes, 2000, 2001).

Although client attachment per se is not the subject of this study it clearly has some relevance for the quality of the therapeutic relationship, the attachment dynamics in therapy, the behaviour of the therapist and the progress and outcome of therapy, all of which remain questions for ongoing study. In particular the potential for *change* in client attachment status and how this is achieved has clear links to how the therapist uses his or her relational skills which, it is argued, is associated with therapist mentalization and the influence of therapist attachment.

### 2.3.2.Therapist attachment.

Whilst the attachment status of the client is important, much less in known about the relevance and influence of therapist attachment style despite the acknowledgement by

some that it could be central to the therapeutic process (Slade, 2000). Most psychotherapeutic training emphasises that becoming a successful therapist depends on being aware of and managing one's own reactions to clients. There is therefore deliberation about whether the therapist's own experience of attachment affects his or her ability to act as the "secure base" (Bowlby, 1988), that is, to be emotionally available and responsive to clients. Some have suggested that therapists should exhibit relatively secure attachment styles, since attachment insecurity in the therapist might interfere with the therapeutic process (Slade, 2008). However, empirical research supports this only in part; Leiper and Casares (2000) found 70% of their sample of Clinical Psychologists to be securely attached, a percentage similar to the proportion of securely attached individuals in the general population, usually expected to be around 60-65% (e.g. van Ijzendoorn & Bakermans-Kranenburg, 1996). In a mixed methods study with just twelve Counselling Psychologist participants, Rizq & Target (2010) found six had insecure attachment styles and pointed to the need for a larger scale quantitative study to find a representative interpretation for therapists as a whole.

Notwithstanding the paucity of attachment research in therapists, the attachment orientation of the therapist might also be subject to a number of influences which may lead to an even more complex set of relationships between therapist attachment and behaviour. Experienced therapists undergo significant training and accumulate a large number of client hours during which attachment representations will have been evoked. Due to ethical responsibilities and a wish to relate to clients appropriately, therapists may have consciously endeavoured to suppress any inclinations to behave in a way commensurate with relationship insecurities. Therapists will usually also have made significant investment in their own personal therapy as part of a comprehensive training programme. This requirement increases the likelihood of the therapist being able to contemplate their clients' experiences and reduces the opportunity for "blindspots" to interfere with the therapist's work (Farrell, 1996). More extensive therapy is often undertaken if trainees self-report an insecure attachment style prior to training (Leiper & Casares, 2000) and in a recent mixed methods study, Rizq and Target (2008a, 2008b) concluded that therapists valued personal therapy as a means of developing the ability to reflect on the self and others in clinical practice. Interestingly their participants also described the relevance of early attachment experiences to the development of a reflective capacity.

Thus, therapist attachment orientation per se may not necessarily predict the dynamics of the working relationship with clients in a straightforward way and a degree of

dissociation might be expected between attachment style and related behaviours. One way of exploring these issues may be to consider the effect that attachment may have on one particular therapist attribute, i.e. mentalizing, and how this relationship might be different in therapists compared to the general population.

There is evidence that secure therapists can more easily put aside their own attachment representations in order to respond to the client's presentation without the risk of significant unhelpful countertransference issues (Dozier et al., 1994; Tyrell et al., 1999). Since gentle challenges to the client's attachment organisation may be an important component of therapeutic change (Slade, 2008), the ability to relate to clients in this way seems critical, and research to date suggest that this flexibility and an ability to modulate responses to relate effectively to any individual client in any session is much more typical in therapists who are themselves securely attached (Daly & Mallinckrodt, 2009). An example of this is "therapeutic distance"; the degree of intimacy adjusted throughout therapy to create a corrective attachment relationship. It is gradually increased for clients displaying attachment anxiety, who need to manage their anxious response, or gradually decreased for avoidant clients who have to overcome their fears of intimacy. Experienced therapists (nominated by peers as particularly effective) tend to manage "therapeutic distance" well (Daly & Mallinckrodt, 2009) although not necessarily at a conscious level.

There is equivocal evidence about the relationship between therapist attachment styles and the quality of the therapeutic relationship. It has been shown that the therapist's degree of comfort with closeness in interpersonal relationships predicts the client/therapist bond (Dunkle & Friedlander, 1996), and that more secure therapists seem better able to respond to the client's actual needs rather than those presented (Dozier et al., 1994). Similar findings by others have broadly corroborated these conclusions (Black, Hardy, Turpin, & Parry, 2005; Rubino et al., 2000). However, fewer studies have contemplated the effect of insecurity in the therapist. Focussing on this, both Ligiero and Gelso (2002) and Sauer et al. (2003) found that therapist attachment anxiety was positively related to the therapeutic alliance in early therapy, although it seems that some of this effect may be due to anxious therapists working harder, and the relationship did not hold over time.

In a study by Levitt, Butler and Hill (2006), grounded theory interviews revealed interesting qualitative feedback on what clients *dislike* about their therapists which could arguably be related to therapists' attachment styles; for example, a relationship becomes "dangerous when it….confers dependence upon clients, or allows clients to manipulate

therapists" (p319), or "the therapist is experienced as too distant, defensive or unattuned to clients' emotions. However, caring is too intense if the therapist is experienced as jealous, controlling, or pitying" (p320). The suggestion is, therefore, that insecure therapist attachment styles are in danger of negatively influencing the therapeutic relationship, or that therapists must try to inhibit the manifestation of their attachment styles in order for the therapeutic work to be valuable.

Notwithstanding all the above, Ligiero and Gelso (2002) ultimately found no relationship whatsoever between therapist attachment patterns and therapeutic alliance rated by either client or therapist. The implication, therefore, is that the effect of therapist attachment orientation is complicated and additional research is clearly required both in terms of what the influence of attachment may be and how it may be manifested.

### 2.3.3. The relationships between therapist attachment, social-emotional processing and more complex mental state understanding.

To recap, highly limited research has been conducted focussing on the relationship between therapist attachment styles and therapists' abilities in either emotion understanding and processing, or in more complex areas of mentalizing. Neither have previous studies used such a broad range of self-report and behavioural or experimental tasks designed to tap both mental state understanding and proclivity to use mentalizing skills with a view to understanding how they may be influenced by attachment anxiety or attachment avoidance. Further, the author is not aware of studies that aim specifically to explore how therapists may behave differently to others in their use and management of mentalizing capacity.

It is not therapists' attachment styles per se that is the focus of this study, rather the way therapists' attachment influences arguably one of the most important relational skills that the therapist may possess, his or her mentalizing capability. Of similar interest is the way the relationship between attachment and mentalizing may differ in therapists compared with the general population, since this has the potential to inform us about the effects of experience and training in the use of mentalizing capabilities, and about the ability to reduce or overcome the effects of attachment orientation on behaviour. One way of exploring the broader effects of attachment, therefore, is to consider mentalizing as a manifestation of underlying attachment organisation.

## 3. Mentalizing

As in the section above on attachment, a full review of the mentalizing literature is given below, beginning with an understanding of mentalizing in childhood as a background to the concept of adult mentalizing and measurement as the main point of interest.

### 3.1. Defining mentalizing.

The typically developed human mind continuously makes inferences about the desires, attitudes, intentions and beliefs of others (their mental states) in order to make sense of and predict behaviour (Dennett, 1987; Frith & Frith, 2003; Premack & Woodruff, 1978). The ability to do this constitutes a central aspect of social cognition, regarded to be a human-specific skill and a vital component of functioning in social groups (Adolphs, 2003; Herrmann, Call, Hernandez-Lloreda, Hare & Tomasello, 2007). Premack and Woodruff's original paper termed this concept "Theory of Mind", although several other terms such as "intentional stance" (Dennett, 1987) have also arisen and are in common use almost synonymously. The dominant approach to the concept of Theory of Mind (ToM) has been to concentrate, perhaps overly so, on the notion of belief and desire understanding, or more particularly false belief, which has been the focus for extensive research as a way of representing and operationalizing ToM (e.g. Perner, 1991).

In contrast, others have construed ToM as a much broader concept, often termed mentalizing (Astington et al., 1988; Baron-Cohen, 1995; Fonagy, Target, Steele, & Steele, 1998; Frith, 1989; Frith & Frith, 2003; Frith, Morton & Leslie, 1991) which encompasses a wider range of mental state attributions to the self and other including cognitive and emotion states other than solely belief and desire (Wellman, 1990). The operationalizing of mentalization has therefore begun to include broader tasks that do not strictly test for a representational concept of mind as in false belief tasks, but include tasks that might assess the distinction between social and non-social stimuli, the attribution of intentionality to human action, or explore talk about mental states (e.g. Bartsch & Wellman, 1995; Meltzoff, 1995; Woodward, 1998). Further, the concept of mentalizing is often used in the psychoanalytic literature and refers to reflection and elaboration on affect and mental states, symbolization and aspects of psychic reality (Allen, 2003; Fonagy et al., 2002).

In this study, the term mentalizing is used and a broad definition employed, which includes elements of perspective taking and wider elements of social cognition. The tasks and

measures used in the study cover broad and narrower elements of mentalizing, and are focussed on the relevant areas of mentalizing commensurate with the study's aims.

## 3.2. Why is therapist mentalizing important?

Through mentalizing, typically developed humans routinely endeavour to decipher what those around them are thinking and feeling, inferring their intentions and desires and trying to construct an understanding of their dispositions (Mitchell, 2009). This is especially true for therapists, who not only need to be relatively adept at this, but also, rather than passively read another's mind, are required to influence what others think, feel and do. It is known that the therapeutic world has become increasingly interested in the client/therapist relationship (e.g. Norcross, 2002; Wachtel, 2008) and that it is highly important in client experience and outcome (Asay & Lambert, 1999; Beutler & Harwood, 2002; Keijsers, et al., 2000; Krupnick, et al., 1996). The creation of this relationship might involve several distinct operations: i) reading the non-verbal and verbalised thoughts and feelings of the client in order to assess their current experience, ii) using one's own appropriate affective and cognitive responses to formulate an empathic response, and, iii) managing, through meta-cognition (Flavell, 1976), one's own mental state responses in order to focus entirely on the client's experience. It is contended here that the ability to represent and attribute mental states to the self and others, i.e. mentalize, is fundamental in these tasks.

As noted above, one aim of this study is to explore in depth whether mentalizing abilities in a group of therapists are more advanced than a group of non-therapists. With the benefit of utilising a number of tasks designed to tap into different aspects of mentalizing, it might be expected that dissociations between aptitudes in separate aspects might exist. In particular, aspects that may be enhanced by experience as a therapist, for example, the proclivity to use one's mentalizing skill as opposed to simple mental state understanding. Overlying all of this is the effect of the therapists' attachment style on such attributes.

## 3.3. Mentalizing research

### 3.3.1. Mentalizing in children: false belief studies

Dennett (1978) proposed that one of the most stringent tests for the presence of a mentalizing capability is the prediction of another's behaviour on the understanding that their view of reality can be mistaken, often termed "false belief". The most common test for mentalizing in children is the "false belief task" and it was Wimmer and Perner (1983)

who commenced an extensive false belief research paradigm aimed at understanding when children first develop mentalizing abilities. Wimmer and Perner's (1983) task involves a boy, Maxi, who helps his mother unpack the shopping, putting the chocolate into a cupboard with the intention of coming back for it later. When he has gone to play, his mother takes the chocolate out of the cupboard, but returns it to a different cupboard. Maxi returns later to the kitchen to search for the chocolate. The test question concerns which cupboard Maxi will look in for his chocolate. The child passes the test if he or she answers according to Maxi's reality rather than the child's understanding of what he or she knows to be true. Wimmer and Perner (1983) found that children began to pass the test at around four or five years old.

An alternative version of the task was developed by Baron-Cohen, Leslie and Frith (1985). They used two dolls, Sally and Anne. Sally places her marble into her basket and leaves the room. Anne then takes Sally's marble out of the basket and places it in her own box. Sally returns and the test question concerns where Sally will look for her marble. If the child points to the basket, they have understood that Sally has a false belief, and they pass the task. Those failing the test are unable to represent that Sally holds a different belief to their own. Control questions ensure that the child has real knowledge and accurate memory of the marble's whereabouts. Again, it was found that children pass this test at around four years old with the transition from success to failure in both tasks being fairly rapid (Perner, Leekam & Wimmer, 1987). These studies and others were represented in Wellman, Cross, and Watson's (2001) seminal meta-analysis of 178 false belief studies involving more than 4,000 children in which they concluded that performance in explicit false belief tasks rises above chance at around four years of age, signifying a conceptual change in mental state understanding at this point. Cross-cultural studies indicate the universality of this developmental stage (Avis & Harris, 1991).

False belief tasks are explicit in nature. They require explicit understanding of the verbal descriptions of the tasks and explicit verbal responses. However, some recent studies using alternative tasks have shown that an implicit non-verbal understanding of mental states may be present in younger children. Typically developing children are now known to pass implicit versions of false-belief tasks, such as looking or violation-of-expectation tasks, some time before passing explicit questions about false belief (Ruffman, 2000; Ruffman, Garnham, Import & Connolly, 2001). For example, Clements and Perner (1994) showed that children at around three years old look to a false belief location despite not passing the explicit false belief task until around four. They suggest that younger children's correct looking is based on a different form of knowledge, i.e. implicit

knowledge. They may be able to represent the other person's false belief but are as yet unable to base verbalized judgments on it, possibly because they do not understand its relationship to the real world.

Clements and Perner (1994) arrived at the view that an understanding of false belief seemed unlikely in children of less than three years old. However, more recent findings have called this timing into question still further. Southgate, Senju and Csibra (2007) measured whether children actually anticipated outcomes based on false belief before they happen. They clearly showed that 25-month-old children anticipated behaviour based on false belief, again suggesting that an implicit representational ToM may precede children's success on explicit false belief tasks by a considerable period. Furthermore, Onishi and Baillargeon (2005) used a violation-of-expectation experiment with 15-month-old pre-verbal infants and found that they were surprised when a woman reached to a location for an object that was unexpected according to her prior knowledge. Their assumption was that 15-month-old infants have some understanding of false belief.

This begins to challenge the idea of a conceptual change in false belief understanding at around four years old (Wellman et al., 2001). Despite an apparent inability to pass classic false belief tasks before this age, infants show some understanding arguably from as early as a few months, and certainly from around 18 months to two years (Doherty, 2009; Frith & Frith, 2003). This has prompted a debate between two central conceptual approaches to early false belief understanding, revolving around the relationship between early implicit mentalizing and later explicit mentalizing.

The "nativist" approach (e.g. Baillargeon, 1987; Leslie, 2005) suggests that evidence indicates one false belief understanding ability, present from infancy, and tapped by all the above experimental tasks. The differences in developmental timing are explained simply by differences in task demands: explicit or implicit. Explicit verbal tasks require a direct response from the infant and demand additional cognitive resources to those being measured. Belief tasks are failed not because children do not understand the mental state concepts but because they do not have sufficient cognitive resources (Leslie & Thaiss, 1992). Conversely, looking-time tasks are spontaneous, non-elicited tasks and are implicit. In this rich account of belief understanding, whilst the measures are different, the early and later understanding is the same. Evidence for this approach includes work by Low (2010) who found that implicit knowledge predicts and therefore underpins explicit verbal false-belief understanding. Leslie (Leslie, 2005; Leslie, Friedman & German, 2004) uses this to argue that there is an innate neuro-cognitive module or mechanism of rudimentary mental state understanding, maturing in the second year of life.

Conversely, "constructivists" such as Perner (Perner, 1991; Perner & Ruffman, 2005), Apperly (Apperly & Butterfill, 2009; Samson, Apperly, Braithwaite, Andrews, Bodley Scott, 2010) and Wellman (1990, 1993) favour an alternative account, arguing for the existence of a developmental conceptual change necessary to pass false belief tasks. Early implicit knowledge, tapped by the looking paradigm, is non-mentalistic and is to do with how infants predict behaviour. This implicit knowledge becomes subsumed and develops into a separate conceptual, explicit understanding which is verbal and accessible. Apperly (Samson & Apperly, 2010) goes further and postulates there are two different systems, one an automatic, implicit and rudimentary early system, and one a cognitively reflective, effortful and explicit system. As evidence, it seems that people respond more slowly to questions requiring mentalizing use, suggesting that they may be cognitively demanding (Apperly, Riggs, Simpson, Chiavarino, & Samson, 2006), and those who are distracted or asked to respond quickly seem less likely to use what they know about others to make mental state inferences (Epley, Keysar, Van Boven & Gilovich, 2004). There is also evidence that some of these processes are selectively impaired in brain damage (Samson, Apperly, Chiavarino & Humphreys, 2004; Samson, Apperly & Humphreys, 2007).

Whilst this debate is important, and has implications for future research in mentalizing, the measures in this study are concerned primarily with explicit and effortful mental state understanding.

### 3.3.2. Mentalizing in children: broad influences

There are some broad cognitive, social and environmental influences on mentalization in children which are not addressed directly by this study but which merit a brief outline here for the sake of completeness in reviewing the literature.

#### 3.3.2.1. Executive function

Executive function has been found to play a role in the development of mentalizing abilities (see Doherty, 2009 for a full review). Many executive functions appear to develop at the same time as the ability to represent and attribute false beliefs (e.g. Jones, Rothbart & Posner, 2003) but the nature of the relationship is far from clear. There are two competing explanations for the association (Moses, 2001). According to the *expression* account, children who fail false-belief tasks do so not because they lack an understanding of false

belief, but because of the additional executive demands that these tasks require (Mitchell, 1996; Mitchell & Lacohée, 1991). To answer a false-belief question correctly, children have to inhibit a tendency to report the truth and instead focus on an abstract mental state, simultaneously remembering the events that have transpired. As executive skills develop sufficiently to negotiate task demands, children become able to express their otherwise latent ToM understanding (see, e.g., Carlson, Moses & Hix, 1998). However, the data from Wellman at al.'s (2001) meta-analysis suggests that if the executive demands of ToM tasks are reduced significantly, only a moderate improvement in performance is seen. Intrinsically, therefore, expression accounts appear less plausible (Doherty, 2009).

An alternative account is that executive functioning is fundamentally necessary for the *emergence* of children's ToM (e.g. Moses, 2001). Mental states are abstract entities whose relationships to the world are not immediately transparent, particularly if they do not correspond with reality (as in false-belief tasks). Research suggests that exposure to opportunities for reflecting on the discrepancy between mental states and reality is important for ToM development (e.g. Brown, Donelan-McCall, & Dunn, 1996). Developmental gains in executive functioning may provide children with improved abilities to engage in and capitalize on these experiences. This account holds that domain-general executive skills might be necessary but not sufficient for the emergence of ToM concepts; exposure to relevant experiences is also crucial (Moses, Carlson, & Sabbagh, 2004).

#### 3.3.2.2. Language

Happé (1995) originally showed that language ability in children was associated with passing false belief tasks. Astington and Jenkins (1999) subsequently found that early language ability at three years of age predicted later mentalizing performance. They suggested that syntactic abilities are necessary to represent the spatial arrangement of objects both in the real world and in another's mental representation of it, even if those two things conflict. Thus, it is syntax rather than general linguistic ability that is important. These findings were extended by Ruffman, Slade, Rowlandson, Rumsey, and Garnham (2003) who showed that language at around the age of three years predicted belief understanding over the next two and a half years. However, it was not

syntax that predicted performance, rather semantics and overall language ability. This is substantiated by Milligan, Astington and Dack's (2007) meta-analysis of 104 studies which confirms that many aspects of language relate to mentalizing, and suggests that false belief understanding develops as a result of language in general, but that in turn false belief understanding also promotes further language development (though the strength of this relationship is weaker than in the other direction).

A key hypothesis relating to how language influences mentalizing is via the opportunity to talk about mental states. The study of deaf children shows that late-signing deaf children are significantly delayed in passing false belief tasks (e.g. Peterson & Siegal, 1999; Russell, Hosie, Gray, Scott, Hunter, Banks et al., 1998; Schick, de Villiers, de Villiers & Hoffmeister, 2007; Woolfe, Want & Siegal, 2002). This is different to native signers (deaf children born into signing families) who have early access to language and who perform well on false belief tasks (Woolfe et al., 2002). Explanations for the delay in late signers include an absence of conversation and experience relevant to mental states, limitations on social interaction, and reduced activities such as pretend play. On balance there seems good reason to believe that conversation plays a key role.

Alternative avenues of research into the relationship between linguistic conversation and mentalizing relate to other social cognitive influences such as demographic and familial social interactions. These are discussed in the following sections.

#### 3.3.2.3. Demographics and socio-economic status

Twin studies have found a genetic influence in mentalizing abilities (Hughes & Cutting, 1999; Hughes & Plomin, 2000). Despite this, however, Hughes, Jaffee, Happé, Taylor, Caspi, and Moffitt (2005) concluded that environmental factors rather than genetic influences explained the majority of the mentalizing variance in their 1000+ sample. Relevant environmental and social factors include influences such as parental occupation, mother's education and social class (Cutting & Dunn, 1999). Most studies seem to show that there are few cross-cultural differences in the age at which children develop mentalizing skills (e.g. Avis & Harris, 1991; Callaghan, Rochat, Lillard, Claux, Odden, Itakura, et al., 2005; Vinden, 1999), although one exception to

this has been a delay in Japanese children (Doherty & Kikuno, 2005; Naito & Koyama, 2006) the precise reasons for which are yet to be investigated.

#### 3.3.2.4. Siblings

Additional research has focussed more on proximal areas of influence such as sibling and parent interactions. Accelerated false belief understanding has been found to have a positive association with larger families (Perner, Ruffman and Leekam, 1994) and subsequently with the number of older (but not younger) siblings (Ruffman, Perner, Naito, Parkin, & Clements, 1998). These effects may be due to everyday interactions stimulating awareness of siblings' thoughts and feelings, through pretend play or language. However, some have found no evidence of a sibling relationship at all (e.g., Cutting & Dunn, 1999; Meins et al., 2002). Whether sibling influences are important therefore is still open to question and it may be that the timing of a mentalizing capacity is influenced, but not the degree of ultimate ability.

#### 3.3.2.5. Parenting

Parents and parenting have also been found to have strong influences on the development of children's mentalization. The strongest of these appears to be through conversation, but other studies have also found links with other parenting attributes, for example, discipline style (Ruffman, Perner & Parkin, 1999), and encouraging interaction within extended families (Lewis, Freeman, Kyriakidou, Maridaki-Kassotaki & Berridge, 1996). The importance of discussing feelings between infants and mothers was highlighted by Dunn, Brown and Beardsall (1991) who found that emotional understanding in three year olds was strongly related to diversity of talk about feelings, often taking place around disputes at home. Further, factual and causal talk between mothers and children, in particular the use of mental state language, has been found to facilitate both 3-year-old's language ability and false belief success (Dunn, Brown, Slomkowski, Tesla & Youngblade, 1991). Ruffman, et al., (2002) found a causal relationship between mother's use of mental state utterances and later mentalizing ability even after accounting for possible mediators such as earlier mental state understanding and mother's education, and indeed a child's own language ability.

Given these research findings, it seems clear that a key social correlate to the development of children's mentalizing is mental state talk, in particular that experienced through conversation with the child's primary carer, usually the mother. This important concept and its measurement are explored further below in section 3.3.8.

### 3.3.3. Measuring mentalizing in adults in contrast to standard developmental tasks for children

The popularity of false belief tasks as indicators of a mentalizing capacity in young children together with the scarcity of empirical mentalization studies in older children has led to a common assumption that the end-point of mentalization development is during early school age (Samson & Apperly, 2010). This may explain why studies of adolescent and adult mentalizing are significantly fewer in number than those addressing the developmental aspects in children, despite indications that change continues well into later childhood and adolescence (Chandler, Boyes, & Ball, 1990; Wellman, 1990). Another reason for the dearth in adult mentalization studies has been because few measures existed which adequately tested adult mental state understanding in the normal population. In more recent years, however, researchers have argued that the use of parametric testing would avoid measurement hurdles such as ceiling effects or the overly simple outcome of a pass/fail criterion on a particular task. Parametric tests include reaction times, error rates and probability estimates, measured over a series of multiple trials (Samson & Apperly, 2010). The evidence emerging from these studies suggests that adults are not necessarily performing at ceiling in mentalizing tasks, and adult mentalizing should not be conceptualized using a simple have/have not framework (e.g. Birch& Bloom, 2007; Keysar et al., 2000; Keysar, Lin, & Barr, 2003).

Indeed, whilst the consensus was once that a mentalizing ability was something possessed or not, recent studies show that rather than an all or nothing capability, there are profound individual differences in both typically and atypically developed individuals (Repacholi & Slaughter, 2003; Sprung, 2010). The mentalizing system appears to be multi-faceted and general failure is not always manifest, rather some aspects are lacking (Astington & Baird, 2005). Research is often based on many different standard and non-standard developmental stage-relevant measures, which can show dissociations or composite scores rather than task specific analysis (Sprung, 2010). Unfortunately, these are often inappropriate for adults who would not be expected to make errors in first or even second order false belief tasks (Apperly, Samson & Humphreys, 2009). One solution is to make tasks more complicated or simultaneously present a competing task (Bull,

Phillips & Conway, 2008) but it is difficult to disentangle the roles that other cognitive skills play in successful task completion (Apperly et al., 2009). An alternative approach may be to keep belief reasoning tasks as simple as possible but measure processing time rather than error rates as these can provide an indication of comprehension but also of proclivity to use (e.g. Apperly et al., 2006; Keysar et al., 2003). For all these reasons, a broad range of mentalizing tasks is included in this study, including those using multiple trials, reaction times, and parametric tests, all designed to test several different aspects of mentalizing.

### 3.3.4. Social-Perceptual versus Social-Cognitive components

Several researchers have argued the existence of multiple components of mentalization. For example, Tager-Flusberg and Sullivan (2000) propose two distinct components of mentalizing; a social-perceptual and a social-cognitive component. Their main hypothesis delineates an important distinction between the online immediate perceptual judgement of mental states and the capacity to make more complex cognitive inferences about mental states as tapped, for example, by false belief or perspective taking tasks. Evidence for this originates from several sources, in particular from work with children suffering from Williams Syndrome. These individuals appear to have good capabilities in the social-perceptual component of mentalizing (Tager-Flusberg, Boshart & Baron-Cohen, 1998; Tager-Flusberg & Sullivan, 1999) while experiencing difficulties with the social-cognitive component (Porter, Coltheart & Langdon, 2008; Santos & Deruelle, 2009; Tager-Flusberg & Sullivan, 2000). Evidence from neural research also suggests that mental state reasoning may be fractionated into at least two functionally and anatomically distinct neural circuits (e.g. Sabbagh, 2004). Specifically, the ability to decode mental states from social-perceptual cues (such as facial expressions) may rely on contributions from the orbitofrontal/medial temporal circuit within the right hemisphere. In contrast, the ability to reason cognitively about mental states may rely on left medial frontal regions, especially the Temporoparietal Junction (TPJ).

Ordinarily, these two aspects of mentalizing combine to produce reliable judgments about others' mental states. However, the distinction between the two processes is important because they rely on different social-information processing skills (Sabbagh, 2004). Mental state decoding relies principally on social-perceptual information that is gleaned in the immediate and observable environment (e.g. facial expression). Conversely, cognitive reasoning of mental states requires one to access knowledge and facts about the person in question or their contextual circumstances.

#### 3.3.4.1. Social-Perceptual: the importance of the eyes

Social-perceptual information processing includes distinguishing between people and objects, and making online rapid judgements about people's mental state from their facial and body expressions (Tager-Flusberg & Sullivan, 2000) and other social non-verbal stimuli such as voice tone. Research corroborates that the eyes in particular are hugely important in judging not only someone else's visual perceptual experience, but also when and what another person is thinking (Baron-Cohen & Cross, 1992). Typically developing human infants are oriented very early to eyes as providers of information (Butler, Caron, & Brooks, 2000; D'Entremont, Hains & Muir, 1997; Moore & Corkum, 1998; Woodward, 2003) and at around three years, there is evidence that children understand gaze as referential, i.e. related to the mental state of the looker (Anderson & Doherty, 1997; Baron-Cohen, 1995; Butler et al., 2000; Doherty & Anderson, 1999). Several theorists have therefore proposed that gaze understanding is a precursor to understanding belief (e.g. Baron-Cohen, 1995; Gopnik, Slaughter & Meltzoff, 1994), and that the social-cognitive component of mentalizing builds on this earlier social-perceptual knowledge (e.g. Baron-Cohen, 1994; Hobson, 1993; Wellman, 1990). However, while the eyes carry reliable and important information about others' mental states (see Kleinke, 1986), the information is subtle and difficult to interpret when separated from additional contextual information provided by a whole-face expression (Ekman & Friesen, 1978).

Most measures of the social-perceptual component of mentalizing also involve some additional linguistic and cognitive (e.g. working memory or attentional) ingredients, which may overlap with social-cognitive capacities. Thus, tasks generally measure both components, involving an integration of perceptual and cognitive information processing.

#### 3.3.4.2. Social-Cognitive: Perspective Taking

According to Tager-Flusberg and Sullivan (2000) the social-cognitive component of mentalizing incorporates what has traditionally been referred to as ToM. This component entails the conceptual understanding of the mind as a representational system and false belief tasks are the prototypical measure. It also involves the ability to understand others' perspectives (that is, not just *what* someone can see but *how* they might see something). Assessing

perspective taking is conceptually comparable to belief understanding and is a useful alternative for measuring mentalizing in adults.

One group of researchers has explored an innovative experimental paradigm in adult perspective taking which has enabled the measurement of explicit mental state understanding and permitted a distinction between comprehension and proclivity to use mentalization (Keysar et al., 2000; Keysar et al., 2003). The studies provide striking evidence that the end-point of mentalizing development is not a faultless or ceiling performance (Samson & Apperly, 2010). The experiments involve the participant moving objects around a grid on the instruction of a director who is able to see some objects but not others which are hidden from him. Even though participants know the director cannot see some objects, sometimes they still move an object which the director could not possibly see given his point of view. Such an action indicates that the participant could not have taken the director's perspective into account and shows a dissociation between an ability to distinguish one's own beliefs from others', and the routine deployment of this in interpreting the actions of others (Keysar et al., 2003). Eye-tracking data (in particular reaction times) show that the participant often fixates first on the object the director cannot see before they correct themselves from the egocentric perspective. In around 20% of cases this correction did not take place (Keysar et al., 2000). Hence, despite normally developed adults possessing the ability to interpret social actions by means of a mentalizing ability, they do not necessarily reliably use or apply it automatically.

Keysar et al. point to a tendency to assume that what is present to one person will be salient to another, i.e. that we are naturally egocentric in social interactions (Barr & Keysar, 2005) and that the processes required to resist this egocentric interference are cognitively costly (see also Birch & Bloom, 2007). An ability to use mentalization in a spontaneous, non-reflective way does not therefore appear to be incorporated into the routine operation of the social interpretation system. Epley, Morewedge and Keysar (2004) also suggest that although the tendency to egocentrism is relevant to both adults and children, adults may be better able to subsequently reflectively correct it by relying more heavily on their mentalizing ability, using it repeatedly and learning from the experience. Evidence from neuropsychology corroborates this hypothesis by showing that the ability to resist interference from one's own perspective can

be selectively and irretrievably impaired (Samson, Apperly, Kathirgamanathan & Humphreys, 2005).

Converse, Lin, Keysar and Epley (2008) went on to argue that using mentalization to recognise differences between one's own and another's perspective is a deliberate process that can also be influenced by mood. They hypothesised successfully that, because sadness is associated with more systematic and deliberate processing than happiness which is associated more with heuristic processing, mentalization would be facilitated more by sadness. They argue that happiness may increase reliance on an egocentric default whereas sadness may promote the elaboration of information about others' mental states through deliberate mentalization use, making inferences less biased. Interestingly, Savitsky, Keysar, Epley, Carter and Swanson (2011) recently showed that individuals make more egocentric perspective-taking biases when their interlocutor is a friend. The authors argue that when communicating with a friend, individuals are often less successful at inhibiting their own perspective, become more relaxed, and "let down their guard".

The above tells us that adult mentalizing can be affected by mood and social situation, but there appear to be other influences as well. Wu and Keysar (2007) investigated the effect of culture on perspective taking using the same paradigm, in an attempt to explore potential differences between collectivistic (Chinese) and individualistic (American) cultures. From eye-gaze data, they concluded that Chinese participants were more attuned to another's perspective than Americans and were consistently faster. Americans could take another's perspective, but only after reflective interpretation and overcoming their own perspective. Chinese participants still reflected but much less so. The authors suggest that cultural patterns of interdependence focus attention on the other encouraging better perspective taking and interpretation of others' actions. In Eastern cultures, the self is often defined in relation to others arguably inducing a tendency to focus on others' actions, knowledge and needs. This is discussed in terms of cultural differences in the universality of endowment of mentalizing (Sabbagh, Xu, Carlson, Moses, & Lee, 2006) and the use of such ability which appears to be enhanced in Chinese participants. In other words, although the groups displayed similar patterns of accuracy, they were different in their proclivity to use their perspective taking skill.

Using explicit measures of adult mental state understanding, the above studies show that social cognition in adults is still prone to egocentric biases, and is susceptible to experience and mood. Processing speed data also shows that there is a difference between possessing a mentalization capability and using it. Further, the *use* of our mentalizing capacity apparently places two demands on us: the need to resist effortfully interference from one's own perspective, and the need to determine what incoming information is relevant (Samson & Apperly, 2010). Given this, differences in the accuracy of and proclivity to use mentalizing skills might be expected in the two groups of individuals, since one group should be trained or skilled in these demands as a result of prolonged connection with the mental states of their clients. This study therefore uses the Keysar perspective taking experiment (e.g. Keysar et al., 2000) to explore understanding and proclivity to use mentalizing in the two groups, and to determine what, if any, influence attachment style has.

### 3.3.5.Cognitive/Affective empathy

Another approach to conceptualising mentalizing is to consider the cognitive element of it as one part of empathy. In its broadest sense empathy refers to the reactions of one individual to the observed emotions and experiences of another (Davis, 1980; Decety & Jackson, 2006), also described as the experience of a connection with someone else's feelings or thoughts (Baron-Cohen & Wheelwright, 2004). In addition, it provides an insight into another's intentions, an ability to predict their behaviour (Baron-Cohen & Wheelwright, 2004; Dennett, 1978) and enables individuals to behave appropriately themselves, including using emotional and physical mirroring (Blair, 2005; Preston & de Waal, 2002). Empathy needs to be regulated (Decety & Jackson, 2006); people who show too little empathy or who are too sensitive to others' thoughts and feelings can experience difficulties in social adaptation (Decety, 2011). Like attachment, empathy is conceptualised by various theorists as (i) dispositional or innate and relatively stable regardless of the interaction or context (Duan & Hill, 1996; Knafo, Zahn-Waxler, van Hulle, Robinson & Rhee, 2008;), or (ii) dependant on situational or environmental factors (Duan & Hill, 1996; Yamada & Decety, 2009), or interpersonal processes (Egan, 2004; Rogers, 1968).

Modern research recognises that empathy encompasses both affective and cognitive components of empathic responses (e.g. Batson, 2009; Davis, 1980; Eisenberg & Eggum, 2009; Goubert, Craig, & Buysse, 2009). The affective component is often associated with bottom up or viscerally-based emotion processing (Decety & Jackson, 2006). It is often

defined in terms of an observer's emotional response to the affective state of another (Hoffman, 1984) and is usually described in emotion terms that are appropriate to the situation. This may be a matched emotion, for example sadness at another's sadness, or an appropriate but differentiated emotion, for example sympathy at someone's desperation. The overlap between self and other representations is not absolute. This would lead to undue levels of personal distress, hamper the natural ability to switch between self and other representations, and lead to confusion of the self-other boundary (Decety & Jackson, 2006). Affective empathy can also be understood as a response to non-visual emotional stimuli such as language (Blair, 2005). Quantifying and measuring affective empathy has been pragmatically difficult and has therefore tended to be achieved using self-report measures such as the Interpersonal Reactivity Index (IRI; Davis, 1980) or the Empathy Quotient (EQ; Baron-Cohen and Wheelwright, 2004).

Cognitive empathy involves an intellectual understanding of the other's feelings and thoughts (Kohler, 1929, as cited in Baron-Cohen & Wheelwright, 2004), also described as attending to another's perspective or responding in a decentred, non-egocentric way (Mead, 1934; Piaget, 1932; both cited in Davis, 1983). The cognitive component of empathy has also been more recently described using the concept of ToM or attribution of mental states to others using representational abilities (e.g. Astington et al., 1988; Baron-Cohen, 1995; Leslie, 1987; Wellman, 1990). There is significant evidence that cognitive and affective empathy are overlapping and highly intertwined functionally and neurologically (Hynes, Baird & Grafton, 2006; Ruby & Decety, 2004) and developmental theories of empathy and emotion understanding, particularly the cognitive component, parallel those of general social cognition, including mentalization (Bull et al., 2008). Cognitive empathy can been measured using both subjective self-report questionnaires as well as objective measures such as ToM, emotion recognition tests, or adult perspective taking tasks (e.g. Keysar et al. 2000, 2003).

An important part of empathy is the perception and recognition of other people's emotions from facial affective displays (Ekman, 1972; Ekman & Rosenberg, 2005; Scherer, 2007). This ability is a central component of emotional competence, social interaction and interpretation or prediction of a person's reactions. However, empathy is not only about recognition but also seems linked to a person's experience of resonating with another. For example, viewing facial expressions of others has been seen to trigger similar expressions on one's own face even in the absence of conscious recognition of the stimulus (Preston & de Waal, 2002). Further, an individual's ability to perceive accurately negative emotional responses in another is greater when the physiological state (e.g. heart-beat, muscle activity) of the two is closely matched (Levenson & Ruef, 1992). fMRI studies confirm

these results; when participants observe facial expressions in others, increased neuro-dynamic activity is seen in brain regions implicated in facial expressions (Carr, Iacoboni, Dubeau, Mazziota & Lenzi, 2003). All this suggests a system that automatically prompts an observer to resonate with the emotional state of another both in terms of motor representations and associated autonomic and somatic responses (Preston & de Waal, 2002).

Given the importance of emotion perception and recognition to empathy, this study employed a facial emotion recognition task, based on the universal facial expressions used by Ekman and Friesen (1971). The task focuses on the core skill of recognition of prototypical expression patterns for certain emotions that are widely shared on a cultural and universal level (Ekman, 1972) as a necessary competence for the interpretation of emotion expression generally and inference in face-to-face communication.

### 3.3.6. Adult studies have so far focussed on group differences

Despite the beginnings of more revolutionary and creative ways of measuring adult mentalizing, the bulk of empirical work to date has concentrated on group differences in mentalizing, either considering gender, or clinical populations.

#### 3.3.6.1. Gender

Women have been found to show more accurate and faster discrimination of facial emotions (Hall & Matsumoto, 2004), and emotion shown in the eye region (Baron-Cohen et al., 2001). They have lower thresholds than men in recognising emotions at increasing intensities (Montagne, Kessels, Frigerio, de Haan & Perrett, 2005) and can label emotions more efficiently (Sullivan & Ruffman, 2004). This corresponds with previous research supporting a female advantage in decoding non-verbal emotion (Hall, 1978; 1984, both cited in Hall & Matsumoto, 2004). In a later study Hall and colleagues (Hall, Hutton & Morgan, 2010) used a facial recognition task and eye-tracking to confirm that the female advantage in the decoding of non-verbal emotion information was related to greater attention to the eyes. Furthermore, women appear to self-report more empathy than men (Lennon & Eisenberg, 1987; Toussaint & Webb, 2005), consistently scoring more highly on several measures, for example the EQ (Baron-Cohen & Wheelwright, 2004) and the IRI (Davis,

1983). Studies concerning adult gender difference in other mentalization skills are sparse but, in children, girls appear to possess a slight advantage on false belief tasks (e.g. Charman, Ruffman & Clements, 2002; Hughes et al., 2005). In any mentalization study, therefore, there is a requirement to control for gender. In this study, whilst gender differences are not a focus, it was necessary to consider gender make up of each group and ensure appropriate gender balance.

#### 3.3.6.2. Clinical populations

The most significant volume of research concerning mentalizing in clinical populations has been in the area of autism (e.g. Baron-Cohen, Tager-Flusberg & Cohen, 1993, 2000). To a lesser extent, studies have also focussed on BPD (Fonagy, Gergely & Target, 2007; Fonagy, Target, Gergely, Allen, & Bateman, 2003) and schizophrenia (Corcoran, 2000, 2001; Langdon, 2005; Sprong, Schothorst, Vos, Hox & van Engeland, 2007).

In BPD, patients experience impaired mentalizing abilities (Fonagy & Bateman, 2008; Fonagy & Target, 2000; Gunderson, 2007; Sharp & Fonagy, 2008; Sharp, Pane, Ha, Venta, Patel, Sturek et al., 2011) usually evidenced by impaired accuracy in emotion recognition (Bland, Williams, Scharer & Manning, 2004; Unoka, Fogd, Füzy & Csukly, 2011; Wagner & Linehan, 1999). Some studies, however, provide evidence of heightened sensitivity to facial and other expressions of emotion (Fertuck, Jekal, Song, Wyman, Morris, Wilson, et al., 2009; Lynch, Rosenthal, Kosson, Cheavens, Lejuez & Blair, 2006; Scott, Levy, Adams & Stevenson, 2011) although this has not been replicated by all studies using the same measures (Preißler, Dziobek, Ritter, Heerkeren, & Roepke, 2010). A current hypothesis concerning the aetiology of BPD is the mentalization theory (Fonagy & Bateman, 2008; Fonagy & Luyten, 2009) in which BPD is considered to be associated with (i) a low activation threshold for the attachment system and (ii) a deactivation of controlled mentalization, resulting in impairment in the differentiation of self/other mental states, leading to hypersensitivity and hypervigilence. In schizophrenia, clinical findings strongly suggest that patients are impaired in social interaction, with Frith (1992) suggesting that mentalizing is compromised because of a failure to monitor patients' own and other persons' mental states and behaviour. There is a dispute as in BPD, however, over whether mentalizing is impaired or

exaggerated in some types of schizophrenia or whether it represents a state or trait marker of these disorders (Brüne, 2005).

#### 3.3.6.3. Autism

Evidence from autism is especially relevant because it involves selective impairments in socio-perceptual and social-cognitive aspects of mentalizing including specific difficulties with the necessary mental state understanding to pass classic false belief tasks (Baron-Cohen, 2000; Baron-Cohen et al., 1993; Frith, Happé, & Siddons, 1994). It is also important because not only are impairments manifest but it is possible to gain insight into the developmental trajectory of these impairments. Research suggests that sub-threshold autistic characteristics are also present in family members of autistic individuals (Bailey, Palferman, Heavey, & Le Couteur, 1998), a discovery which has sometimes been referred to as evidence of a "broader phenotype" of autism (Piven, 2001; Piven, Palmer, Jacobi, Childress & Arndt, 1997). Similarly, first degree relatives of individuals with Asperger's Syndrome also show deficits in the ability to score highly on mentalizing tasks (Baron-Cohen & Hammer, 1997). Such findings support the possibility that mentalizing deficiencies may represent a hereditary cognitive characteristic.

Despite the obvious mentalizing impairments in autism, some high-functioning autistic and Asperger's individuals pass standard mentalizing tasks such as first order false belief tasks, but still demonstrate problems with advanced measures (Baron-Cohen, 2000) and real difficulties in everyday social situations (Klin, Schultz & Cohen, 2000). Language, specifically syntactic ability, appears to be one of the best predictors of autistic subjects' performance on tasks tapping a representational understanding of mind (Tager-Flusberg, 1997, 2000; Tager-Flusberg & Sullivan, 1994). Adults with Asperger syndrome who perform well on a range of both basic and higher order ToM tasks, do not activate the same regions of the medial frontal cortex when they are engaged in ToM tasks as do normal adults (Tager-Flusberg & Sullivan, 2000). This suggests that they may be relying on different, non-social cognitive and linguistic mechanisms such as logical reasoning to process social-cognitive information (Happé, Ehlers, Fletcher, Frith, Johansson, Gillberg, et al., 1996; Happé & Siddons, 1994; Peterson, Wellman & Liu, 2005).

The most commonly used stimuli for investigating the processing of social-perceptual information in autism are pictures of human faces, although

videotapes of social interactions, human voices etc. have also been used (reviewed in Boraston & Blakemore, 2007). Evidence suggests that faces are processed differently by individuals with autism (e.g. Langdell, 1978; Schultz, Gauthier, Klin, Fulbright, Anderson, Volkmar et al., 2000). For example, autistic individuals are markedly inattentive to faces (Osterling & Dawson, 1994), fixate the eye region of the face less (e.g. Klin, Jones, Schultz, Volkmar, & Cohen, 2002) and make less frequent and abnormally timed eye-contact (Dawson, Osterling, Meltzoff, & Kuhl, 2000).

Individuals with autism or Asperger's Syndrome seem to experience a significant impairment in monitoring gaze direction (e.g. Baron-Cohen, Baldwin & Crowson, 1997) and in decoding information contained in eye-gazes (e.g. Baron-Cohen et al., 2001; Baron-Cohen, Wheelwright & Jolliffe, 1997). In particular, Baron-Cohen and colleagues found that whilst these adults are able to detect basic mental states in the whole face, they are compromised in recognising complex mental states, and distinctly impaired at recognising mental states from the eye region alone. This has been corroborated and extended by several researchers (e.g. Klin et al., 2002; Riby, Doherty-Sneddon, & Bruce, 2009; Spezio, Adolphs, Hurley & Piven, 2007), although there are also findings that are at odds with this (e.g. Back, Ropar & Mitchell, 2007, in adolescents), and debate continues regarding the ecological validity of measures and nature of the stimuli used. In Corden, Chilvers and Skuse's (2008) study of eye fixation patterns of Asperger's adults, they suggest a hypothesis of avoidance of emotionally arousing stimuli in an attempt to reduce anxiety and over-arousal.

Recent research in autism has also given credence to the dual explicit verbal/implicit nonverbal conceptualisation of mental state understanding. Senju, Southgate, White and Frith (2009) used an eye-tracking task replicating their earlier study with children (Southgate at al., 2007) to show that Asperger adults were not able to attribute mental states spontaneously and implicitly in a non-verbal task unlike typically developed adults, but showed no difference to controls in the ability to do so in explicit tasks. The authors suggest these results point to a persistent impairment in early spontaneous mentalizing. However, their data also suggests that the early development of spontaneous mentalizing is not necessarily a precursor to the later ability of conceptually mentally attributing through explicit reasoning. They suggest the former requires spontaneous encoding of socially relevant material and its automatic

computation, whereas the latter can be achieved by verbally mediated reasoning prompted by explicit instructions. It is the implicit aspects of mental state understanding that are proposed by some to be especially important for social-cognitive functioning and that are generally lacking in autistic individuals (Frith & Frith, 2008; Tager-Flusberg, 2007).

Further discussion relating to mentalizing deficits in autism, and specifically to eye-tracking methodology as a method of investigating social-cognitive impairments can be found at section 3.3.9.2 below.

### 3.3.7. Which social-cognitive and social-perceptive measures will be used in the study?

Given the necessity to match mentalizing tasks to relevant aspects of study (Sprung, 2010), a set of tasks has been chosen to explore certain elements of the understanding of, attribution of and reflection on mental states that are relevant to therapists acting in their therapeutic role. The tasks are designed primarily to tap the conceptual and effortful aspects of mentalization.

#### 3.3.7.1. Social-perceptual measure: Eyes test

With the development of the "Reading the Mind in the Eyes" Test ("the Eyes Test"; Baron-Cohen, et al., 1997; Baron-Cohen, et al., 2001), a measure now exists that allows subtle testing of mild deficits in social understanding. The test is sensitive to the implicit non-linguistic aspects of mental state understanding and was developed following research findings highlighting the importance of eye-gaze in emotion understanding. For instance, when a person's eyes are directed away from the viewer to the left or right upper quadrant in the absence of an object, we infer that someone is thinking. Similarly, many other cognitive mental states are observable in the face, and particularly the eyes (Baron-Cohen, Campbell, Karmiloff-Smith, Grant, & Walker, 1995; Baron-Cohen & Cross, 1992; Baron-Cohen, Riviere, Cross, Fukushima, Bryant, Sotillo, et al., 1996). Further, for complex mental states, the eyes but not the mouth provide as much information as the full face, a discovery true for faces of either gender (Baron-Cohen et al., 1997).

The Eyes test has proved able to distinguish very high functioning adults with autism or Asperger's syndrome from controls (Baron-Cohen et al., 2001;

Baron-Cohen, Wheelwright, Stone & Rutherford, 1999), and it correlates inversely with Baron-Cohen's Autism Spectrum Quotient, a measure developed to quantify the extent of an individual's autistic characteristics (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). It is one of the experimental measures used in this study to analyse potential group differences in one aspect of mentalizing, and has been chosen due to its sensitivity and status as a recognised objective measure of advanced mentalizing in adults. It has also been shown to correlate with various other adult social cognition measures.

3.3.7.2. Social cognitive measures: Perspective taking measures.

In this study, a computer based version of the Keysar perspective taking task (Keysar et al., 2000; Keysar et al., 2003) will be used to test for group differences in the ability to take another's perspective, in order to determine whether therapists have enhanced abilities in this area. It is a highly novel test of adult mentalizing, and was developed using elements of earlier referential communication games (e.g. Krauss & Glucksberg, 1977). Due to its repeated trials (128 in total), it represents one of the new range of parametric measures for adults that avoid ceiling affects and simplistic pass/fail results (Samson & Apperly, 2010). The task in its original form is described above in Section 3.3.3.2 and it is used in this study due to its attractiveness as a sensitive measure of adult mentalizing, and because as a specific measure of perspective taking, it is particularly relevant for a study on therapists' abilities to understand another's viewpoint.

The version of the task used in this study differs from the original in a few respects. First, although detailed accuracy and reaction times were recorded, eye-tracking was not used specifically with this task. Further, due to the constraints of laboratory time and space, rather than set up the grid in the laboratory and provide a "real life" director, a computerised version of the task was used in which the participants see the grid on a screen, hear verbal instructions of a "virtual" director, and use a mouse to move the objects. The main benefits of this were: (i) 128 instruction trials could be completed in a reasonable time, and (ii) the director's instructions, tone of voice and grid appearance were uniform for all participants. In addition, although the participant was not given an opportunity to swap with the director to ensure

they understood the task (Keysar et al., 2000), a very detailed set of instructions was explained to the participant, including several references to the director's perspective being different to that of the participant because of the occluded slots in the grid. Examples of the task as experienced by participants can be found in the *Method* Section.

#### 3.3.7.3. Cognitive/affective empathy measures

##### 3.3.7.3.1. IRI

One of the more recent and popular self-report measures for empathy is the IRI (Davis, 1980, 1983). This is an individual difference measure, based on a multidimensional approach. Rather than considering empathy as a single construct, the IRI consists of four subscales: Perspective Taking (PT, assessing the tendency to adopt spontaneously the view of others and to interpret and understand their experiences cognitively), Fantasy (FS, evaluating the tendency to feel the affect and behavioural consequences of fictitious characters), Empathic Concern (EC, assessing "other-oriented" feelings of sympathy, warmth and concern for others), and Personal Distress (PD, measuring self-oriented feelings of personal anxiety and unease in emotional situations). Each of the four subscales was designed to reflect components of empathy already identified in previous theory and research (e.g. Coke, Batson & McDavis, 1978; Stotland, Mathews, Sherman, Hansson & Richardson, 1978; both cited in Davis, 1983).

In a study of construct validity, correlations between the subscales and with other empathy measures (Hogan Empathy Scale, Hogan, 1969; Emotional Empathy Scale, Mehrabian & Epstein, 1972; both cited in Davis, 1983), Davis found clear evidence for the four separate constructs (Davis, 1983). In particular, the PT scale displayed a pattern of association with relatively cognitive measures of empathy, and less emotionality, correlating with higher levels of social competence, higher self-esteem and lower levels of anxiety. The EC scale displayed the opposite dynamic, i.e. a well-defined relationship with emotional reactivity and correlations with shyness, social anxiety and emotional vulnerability. Subsequent analysis showed that

emotional regulation (i.e. the ability to maintain emotional separation and distance) was positively associated with the PT subscale, and negatively with the PD subscale (Pulos, Elison & Lennon, 2004). The IRI was used in this study as a self-report measure of empathy with particular focus on the two subscales arguably most closely related to mentalizing, that is PT and EC.

#### 3.3.7.3.2. EQ

A more recent measure of empathy, the EQ, (Baron-Cohen & Wheelwright, 2004) has applications both as a self-report measure of empathy and clinically as a measure of autistic psychopathology. In a study of EQ validity, reliability, and factor structure, Lawrence, Shaw, Baker, Baron-Cohen and David (2004) reported moderate correlations with the PT and EC subscales of the IRI (Davis, 1980), but only weak or no associations with the PD and FS scales. Indeed the association with PD scale was negative which indicates that the two concepts may even be inversely related. The lack of association with the IRI's FS scale might suggest that this concept may not represent empathy per se (Baron-Cohen & Wheelwright, 2004).

The EQ comprises three factors: Cognitive Empathy, Emotional Reactivity and Social Skills (Lawrence et al., 2004). Cognitive Empathy measures the appreciation of affective states, perspective taking and desire-based states in another, consistent with a definition of ToM. However, relatively strong loadings of emotional state items in this factor versus perspective-taking or desire items may explain why no correlation was found with the PT scale of the IRI which is purely cognitive in nature and focusses on the others' perspective. The Emotional Reactivity subscale reflects the tendency to experience an emotional reaction in response to others' mental states. This factor was moderately correlated with EC and PT scales in the IRI. The third scale, Social Skills, is thought to tap general social skills and understanding. This subscale demonstrated a positive relationship with the IRI PT scale. The three factor structure was corroborated in a psychometric analysis of the EQ by Muncer and Ling (2006). Subsequently, Allison, Baron-Cohen, Wheelwright, Stone and Muncer (2011) used Rasch analysis to

reconfirm that the EQ measures a single dimension of empathy in addition to the three subscales. It will be used in this study as a second self-report measure of empathy.

The IRI is well known, frequently employed and has been utilised in previous studies with therapists (e.g. Hall et al., 2000, see Section 3.4.2). The aim in using the IRI, therefore, was to replicate previous findings of relevant research. The EQ has been used in more recent research concerning empathy, and, as discussed, it challenges some previously advocated constructs (e.g. the FT scale of the IRI). It was used here, therefore, to extend previous research about empathic abilities in therapists. For these reasons, and the somewhat variable correlations between subscales on the IRI and the EQ, both measures of empathy were used.

### 3.3.8. Mental state talk as a marker for mentalizing

In section 3.3.2.5 the potential influence of parenting on childhood mentalizing was explored. In particular, the importance of mental state talk was noted. Mental state talk is relevant to mentalizing in two important ways. First, as discussed, exposure to mental state talk appears to have a profound effect on the child's ability to mentalize. Second, it has been argued that it can be used as a marker for mentalizing ability. Whilst this has been explored in children, it has not so far been researched in adults, or in different groups of individuals.

#### 3.3.8.1. The influence of mothers' mental state talk or mind-mindedness

Meins et al., 1998 have pointed to a mother's use of mental state language as a causal factor for facilitating their child's mental state understanding. In a comprehensive set of studies Meins and colleagues (Meins, Fernyhough, Wainwright, Clark-Carter, Das Gupta, Fradley, et al., 2003; Meins et al., 2002) have explored the concept of "mind-mindedness", or the tendency to focus on and attribute mental states to one's infant, as an important part of the maternal influence on mentalizing. Mind-mindedness was measured by the appropriateness (also referred to as "attuning") of mental state comments used while playing with the child. Appropriateness was measured according to whether the mother accurately read the child's mental state and whether her interactional comments were relevant and constructive. Maternal mind-mindedness was a significant predictor of false belief in the child, even over the child's own language ability. Meins et al. (2002, 2003) suggest the mother's

appropriate mental state language allows children to make sense of their own behaviour by referencing the mental states behind that behaviour.

In Ruffman et al.'s (2002) study, mothers were asked to describe a set of everyday pictures to their children. The more mothers used cognitive and desire terms and "modulations of assertion" where uncertainty is expressed, the better the child's performance was on later mentalizing tasks. Importantly, Ruffman et al.'s (2002) results show that whilst mother's mental state language predicted later false belief performance, neither the child's false belief performance nor their own mental state talk predicted mother's mental state talk. This suggests that the mother's talk is influential on the child's false belief performance rather than the other way round. Further work suggests that mothers appear to scaffold their children's mental state understanding beginning at quite an early age (Taumoepeau & Ruffman, 2006; Taumoepeau & Ruffman, 2008). The suggestion is that mothers adjust their mental state talk to the child's "zone of proximal development" (Vygotsky, 1978), beyond the child's current level of understanding but which the child can manage with assistance. In effect, the co-operative task of conversation therefore enables the child to internalise ways of thinking about thinking with adult partners (Symons, 2004).

Mental state talk and linguistic mental state reflection is therefore seen as a measure of mentalizing and several experimental interventions based on linguistic training have been shown to have had some success in enhancing children's mentalization capabilities. For example, Peskin and Astington (2004) administered a meta-cognitive language reading programme which was shown to increase the children's production of meta-cognitive verbs. There have been several other similar studies aimed at improving children's mentalizing skills (e.g. Hale & Tager-Flusberg, 2003; Lohmann & Tomasello, 2003).

In summary, in the context of childhood exposure to mental state talk, the primary carer's ability to engage in appropriate mental state talk and mind-minded behaviour has significant implications for the development of mentalizing capacities. Although not a direct focus of this study, the corollary of this for adults is that mentalizing abilities may continue to be affected and enhanced by exposure to appropriate mental state language, with clear implication for both therapist and client.

3.3.8.2. Children's mental state talk as marker for mentalizing capacity

It has been established that children's own mental state language ability and use is an important independent correlate with mentalizing abilities (Bartsch & Wellman, 1995). Children begin to use desire terms to talk about their own and others' desires as well as use emotional language by 18 months (Bartsch & Wellman, 1995; Dunn, Bretherton & Munn, 1987). Later, by three years old, references to believing and knowing appear (Bartsch & Wellman 1995; Shatz, Wellman & Silber, 1983).

Mothers' reports of child emotion vocabulary have been correlated with children's performance on emotion recognition at 28 months (Bretherton & Beeghly, 1982) and children's feeling-state talk has also been found to predict mentalizing performance at 40 months (Dunn et al., 1991). Symons, Peterson, Slaughter, Roche and Doyle (2005) studied both parents' and children's mental state talk during story telling but focussed more on the child's unprompted discourse rather than that led by parents. They found that children's mental and emotional language (specifically cognitive and desire states) were positively related to ToM performance even with age, language and social factors accounted for and suggest that it is children's own mind-mindedness that is strongly associated with the development of a mentalizing capability.

3.3.8.3. Mental state talk itself is therefore a measure of mentalizing

The "production" of mental state talk is therefore arguably an alternative measure of conceptual mental state understanding to the comprehension which is demonstrated in a false belief task. However, both can be considered as measures of a mentalizing capacity. Alternatively, it is possible that mental state talk "production" might represent a proclivity to use a mentalizing capacity which may not be same as comprehension. It seems hard to imagine an individual engaging his or her proclivity to use a mentalizing capacity without already possessing an understanding of mental states, but it is possible that an individual may well have a developed understanding of mental states whilst not employing a proclivity to use this capacity.

In support of this, Meins et al. (2006) attempted to investigate the possible relationship between the possession of a mentalization capacity and the use of mental state language in older children aged seven to nine years old. They measured and coded for internal-state language in two different non-

interactional tasks: wordless book narration and describing a friend (tasks were non-interactional in the sense that there was no other individual involved in the task). Meins et al. (2006) found stability in the use of mental state language across the tasks, but no association between performance in mentalizing tasks and use of mental state language. The results are inconsistent with previous results discussed above (e.g. Dunn et al., 1991) which find clear associations between children's mental state talk and mentalizing abilities, albeit in younger children. It is possible that this may be due to the measures used in the other studies being interactional, in contrast to the "off-line" descriptions used in the Meins et al. (2006) study and in others showing similar results (e.g. Charman & Shmueli-Goetz, 1998; Tager-Flusberg & Sullivan, 1995).

These findings may support a theory that focusing on internal states taps into different abilities than does mentalizing performance i.e. having a mentalizing capacity is different from using it to describe and explain the behaviour of others. One implication of this may be that the use or "production" of mental state language reflects a proclivity to use mentalization capacity, and this may be a more sensitive measure of mentalizing than traditional false belief measures. This is consistent with perspective taking research detailed above where evidence suggests that being able to use one's mentalization capacity is as important in reasoning about mental states as understanding them (e.g. Keysar et al. 2000; Samson & Apperly, 2010).

Measuring an individual's use of mental state language, therefore, can be conceptualised either as an alternative measure of mental state understanding, or as measure of proclivity to use a mentalizing capacity. In this study, mental state language "production" is measured as a way of tapping into alternative aspects of mental state understanding, but also acknowledging a possibility that it reflects a proclivity to use understanding in contrast to understanding per se.

#### 3.3.8.4. Which mental state talk measures will be used in this study?

##### 3.3.8.4.1. New methods for mentalizing research in adults

Given the emerging importance of mental state talk in mentalizing research, alternative innovative methods for researching

adult mentalizing have recently been developed using participants' verbal inferences about thoughts and feelings in mental state stories, videos and pictures as a measure of understanding (e.g., Happé, Winner & Brownwell, 1998; Ruffman et al., 2002; Sullivan & Ruffman, 2004). Whilst requiring extensive coding and analysis of utterances they are an accurate measure of spontaneous expressive linguistic mentalizing skills (Sprung, 2010), and have been used extensively also in the study of maternal sensitivity in attachment studies (e.g. Meins et al., 2001).

This study takes a novel approach by using a task based on the original study by Ruffman et al. (2002) of mother's mental state utterances. Individuals are asked to comment on and describe various pictures in which every day social interactions are taking place. The pictures portray emotionally charged or mentalistic situations, for example, a mother carrying her baby across a high bridge, a father scolding his son. They are designed to encourage the participant to utilise mental state language (Ruffman et al., 2002) and participants are asked to describe the picture to someone who cannot see it. Descriptive narratives of the pictures are then analysed and coded for the use and range of cognitive states, desires and emotion words. The task assesses abilities to talk about mental states and measures an element of an individual's mentalization "production" or "use".

The original coding schemes in mental state talk studies (e.g. Ruffman et al., 2002; Symons et al., 2005) counted the presence of mental state terms, e.g. "believe", "ashamed", or modulations of assertion (Ruffman et al., 2002), such as "definitely" or "maybe", which were then summed to give a total score. However, it is recently acknowledged that it is not necessarily what is said but how it is said that is influential. For example, Ensor and Hughes (2008) evaluated the importance of "connectedness" during family interactions. They defined connectedness as a conversational alignment, measured as the frequency with which each speaker's utterances are semantically related to the other speaker's prior utterance. Findings showed that connectedness was a strong predictor of pre-schoolers' performance on emotion understanding and ToM, the strength of the prediction being strongest for mental state references *within* connected turns.

Others have concentrated especially on parents' elaborative styles, i.e. richly embellished descriptions of events and causal or explanatory talk (e.g. Ontai & Thompson, 2002; Ontai & Thompson, 2008; Ontai & Virmani, 2010). This suggests that maternal conversational elaboration is a significant predictor of children's mentalization performance, rather than simple maternal mental state references per se. Elaboration involves a mother reflecting on her child's perceptions of events, contrasting them with alternative perspectives, and enhancing understanding by providing information about feelings, desires and other mental states. Elaborations may be explanatory, causal or contrastive in nature. Examples include, "he is happy because his brother returned", "she is excited to swim in the sea", "they didn't see so they don't believe him".

Slaughter, Peterson and Mackintosh (2007) investigated false belief understanding in relation to what they termed mothers' use of clarifying talk in a picture book reading task. Clarifying talk was defined as explanatory, causal, and/or contrastive talk about cognition, perception and affect, which they contrasted with simple cognition, affect or perception talk. Coding is very similar to that for elaborative talk and results again showed that performance on false belief tasks was significantly correlated with clarifying talk, but not with mothers' simple mentions of cognition. Discourse research has also examined the interrelations between discourse and attachment in the development of mentalization (e.g. Ontai & Thompson, 2008), secure dyads offering optimum conditions for an open and fluid communication style (Bretherton, 1990b).

In this study, group differences in mental state talk as a measure of mental state understanding and production, and relationships with attachment were analysed. Based on the above findings, a choice was made to code for the simple use of mental state words and modulations but also for more complex elaborative and clarifying language. Because the mental state language narrative tasks that were chosen here were not interactional, connectedness was not coded.

3.3.8.4.2. LEAS

This study also utilised the Levels of Emotional Awareness Scale (LEAS; Lane et al., 1990) to assess group differences in emotional awareness, defined as the ability to identify, differentiate and communicate one's own and others' emotions from emotional cues. The LEAS is based on a model developed by Lane and Schwartz (1987) in which emotional awareness is a cognitive skill that undergoes a process structurally parallel to Piaget's (1932) stages of cognitive development. It is based on the development of cognitive schemata reflecting past experience with the language and experience of emotion. The five levels of emotional awareness are hierarchically arranged as follows: physical sensations, action tendencies, single emotions, blends of emotions, and combinations of blends of emotional experiences (see Lane & Schwartz, 1987). The LEAS is comprised of a set of emotionally suggestive vignettes, each involving two people, followed by two questions: ''How would you feel?'' and ''How would the other person feel?'' The degree of differentiation and integration of emotional awareness is reflected through the verbal descriptions of the vignettes. They are presented in written form and provide an alternative stimulus to the everyday picture task detailed above. Coding is undertaken according to the LEAS five level model structured scoring manual (Lane, 1991).

Women consistently score more highly on the LEAS than men by displaying more complexity and differentiation in their descriptions of experiences (Barrett, Lane, Sechrest, Schwartz, 2000). LEAS scores are also positively associated with the ability to recognise emotional stimuli (Lane, Sechrest, Reidal, Weldon, Kasniak, & Scwartz, 1996) and negatively with alexithymia, a disruption in emotional and cognitive processing ability leading to pronounced lack of emotional differentiation (Parker, Prkachin & Prkachin, 2005).

It was decided in this study to utilise the LEAS as a second measure of the production of mental state talk in addition to the mental state talk task within the mentalizing task battery. The LEAS is specifically designed to code affective terms only but it does so in a way

that *levels* of emotional awareness are measured as well as the ability to differentiate complex affective states. In addition, it allows differentiation between emotions ascribed to the self and to the other person, adding an additional layer of mentalizing information.

### 3.3.9.Social orientation as mentalizing

In its broadest sense mentalization has been conceptualised in terms of social orientation, i.e. as a subtle social cognition measured by focussing on orientation towards social stimuli (Klin, 2000; 1991). As observed in Section 3.3.6.3, social perception impairments, particularly to do with gaze behaviour, are seen in many individuals with autism. The possibility has been raised that the social disabilities seen in autism precede even the earliest precursors of mentalizing skills such as joint attention, leading to a suggestion that mentalizing deficits may result from even more basic and early emerging social disabilities (Klin, Volkmar & Sparrow, 1992). Klin suggests that these skills may be important for social adaptation but are not captured in the current conceptualisation of mentalization. He (Klin, 2000) argues that mastering mentalization in its more traditional form and as measured by current standardised experimental tasks is not necessarily sufficient to demonstrate social competence. An ability to be sensitive to social salience may be a significant social cognitive skill in its own right, and may be better measured by tasks with a greater degree of ecological validity. The development of more naturalistic measures that reflect the relatively challenging nature of social scenarios should result in improved understanding of several aspects of research in this area: between group differences may be enhanced and more accurate and relevant individual measures of social competence should be evidenced.

An example of social orientation as a measure of mentalizing may be the reduced preferential looking to social stimuli seen in autism. This area of research has recently been greatly enriched using eye-tracking technology, a technique originally designed to investigate real-time comprehension processes (Eberhard, Spivey-Knowlton, Sedivey, & Tanenhaus, 1995; Tanenhaus, Spivey-Knowlton, Eberhard, & Sedivy, 1995). Normally developed adults show a specific gaze pattern when viewing faces, fixating mainly on eyes, but also nose and mouth (Luria & Strauss, 1978; Walker-Smith, Gale & Findlay, 1977). Conversely, autistic individuals tend to spend a smaller percentage of time examining these core facial areas, noticeably the eyes and the nose (Dalton, Nacewicz, Johnstone, Schaefer, Gernsbacher, Goldsmith et al., 2005; Pelphrey, Sasson, Reznick, Paul, Goldman &

Piven, 2002). Researchers have also found the same tendency for autistic individuals looking at moving film clips rather than static photographs (Klin et al., 2002).

Klin et al.'s (2002) eye-tracking study was the first to record gaze behaviour of autistic individuals while watching short film extracts. Rather than fixating on socially salient social information (e.g. faces and body movements) as would typically developed individuals, participants with autism often looked at irrelevant inanimate details and the fixation of the mouth region appeared to be a strong predictor of social competence. Since Klin et al.'s (2002) original research, a number of further eye-tracking studies have been completed, often focussed on eye-region data. There is a general consensus of decreased eye-region fixations (e.g. Pelphrey et al., 2002; Sasson, Tsuchiya, Hurley, Couture, Penn, Adolphs, et al., 2007), which may be more predominant when viewing moving rather than static images (Speer, Cook, McMahon, & Clark, 2007) and somewhat less pronounced with cartoon-like people (van der Geest, Kemner, Camfferman, Verbaten, & van Engeland, 2002). However, in many studies, atypicalities remain with most stimuli even if ecological validity is reduced somewhat from moving real life pictures (Riby & Hancock, 2008; 2009).

Importantly, Fletcher-Watson, Leekam, Benson, Frank and Findlay (2009) recently sought to replicate realistic social situations with an eye-tracking methodology and found that typically developed adults show a strong tendency to fixate a person-present scene (replicating Fletcher-Watson, Findlay, Leekam, & Benson, 2008). These individuals identify human figures and faces in peripheral vision, move their eyes to that spot with no delay in processing times, and follow the gaze of the person in the scene to the area being fixated. These abilities appear to represent a foundation skill underpinning the development of social cognition from infancy. However, there was a subtle difference in the ASD group: looking at social stimuli was consistently less marked at *first fixation* (as distinct from total dwell time), and further, the ASD group did not follow the gaze of the person on the screen. The authors suggest that, although subtle, the consequences of these differences in social information processing could be highly significant.

Eye-tracking technology thus allows the direct, objective and quantitative observation of looking behaviour (e.g. first fixation duration, total fixation time) indicating what information is available to the brain to process. It allows the indirect measuring of subtle mentalizing behaviours. As a technology, therefore, it has been successful in contributing towards the understanding of the differences between performance on standard mentalizing tests and everyday social ability of individuals with autism (Boraston &

Blakemore, 2007). Taking the approach that social orientation represents a measure of mentalizing, an application of eye-tracking methodology was used in this study exploring eye fixation patterns during the Everyday Pictures task (Ruffman et al., 2002). All the scenes contained both social stimuli and inanimate content and fixation data (both duration of first fix and total fixation time) was collected for fixation times on faces, hands, and non-socially orientated items. The data was analysed for differences in social orientation between the therapists, and the control group.

## 3.4. Therapists' mentalizing abilities

### 3.4.1. Why is this important?

Research suggests that successful outcome in psychotherapy relies heavily on the quality of the relationship between client and counsellor (e.g. Krupnik et al., 1996; Orlinsky, Grawe & Parks, 1994) even in modalities less likely to have focussed on the therapeutic relationship (Keijsers et al., 2000). Some have estimated that up to 30% of the variance in therapeutic outcome can be accounted for by the quality of the client/therapist relationship (Asay & Lambert, 1999). Similarly, in traditional psychoanalytic theory, there is a shift away from a focus on inner processes towards greater emphasis on the relational (e.g. Beebe & Lachmann, 2003). This might include moments of 'genuine dialogue' in a mutual relationship (Buber, 1947, p37), and experiences of real engagement and connection (Stern, 2004), but perhaps one of the simpler definitions of this connectedness is provided by Mearns and Cooper (2005, p. xii) who describe 'A state of profound contact and engagement between two people, in which each person is fully real with the Other, and able to understand and value the Other's experiences at a higher level.'

It has been recognised for a while that the effectiveness of psychotherapy relies heavily on therapist's relational characteristics. In a study on the characteristics of "master therapists", Jennings and Skovholt (1999) found that such practitioners appear to "be able to relate superbly with others" (p9) and clients' perceptions of therapists' characteristics are more significant than many other variables such as theoretical model (Beutler et al., 1986). The crucial role of empathic understanding of the client (Rogers, 1957) has been emphasised and clients often identify counsellors that listen and understand as those that best foster a successful relationship (Keijsers et al., 2000). Clients' perceptions that therapists understand their internal experiences and exhibit empathy relate clearly to therapeutic outcome (Burns & Nolen-Hoeksema, 1992; Greenberg et al., 2001; Lafferty,

Beutler & Crago, 1989; Luborsky, Crits-Cristoph, Mintz & Auerbach, 1988; Orlinsky & Howard, 1986). Whilst other commentators have pointed out that the relationship between therapists' interpersonal skills and outcome is more ambiguous than once thought (e.g. Patterson, 1984), on balance it seems that the ability of the therapist to engage and empathise with the client represents a quality that aids the therapeutic relationship significantly.

Hall et al., (2000) subscribe to the motivational theory that individuals choose to pursue careers that are consonant with their personality characteristics (Holland, 1996). Clinical work should consequently be more attractive to those high on empathic concern and therapists may have gravitated towards a career that provides them an opportunity to behave consistently with their empathic traits (Pines, 1982). They point to a lack of correlation between post-training experience and empathic ability as evidence for earlier differences in empathic ability than that facilitated by training. This may accord with previous research noting apparent equivocal evidence in terms of the difference in outcomes between experienced and inexperienced therapists (e.g. Burlingame, Fuhriman, Paul & Ogles, 1989; Stein & Lambert, 1984).

### 3.4.2. What empirical research is there about therapists and what might be expected?

#### 3.4.2.1. Empathy in therapists

Research has historically focussed on client reported perceptions of therapist empathy (e.g. Keijsers et al., 2000; Orlinsky & Howard, 1986; see section 3.4.1). However, more recently, studies have explored therapists' own self-reported levels of empathy. For example Hall et al. (2000) administered the IRI to a group of psychologists and found that clinical psychologists and therapists scored lower on the Personal Distress dimension. Hassenstab et al. (2007), also using the IRI, found therapists scored more highly on cognitive empathy when making inferences based on language but no differently on emotional empathic concern. In line with Hall et al. (2000), therapists reported less personal distress in response to the distress of others. From this they infer that therapists may possess advanced empathic abilities, but are better able to control their own emotions in emotional situations, possibly because of frequent exposure to affectively charged interactions and a resulting regulation of distress.

#### 3.4.2.2. More complex mental state understanding in therapists

There are fewer research findings applicable to therapists in either the assessment of other mentalizing abilities (other than self-reported empathy) or the tendency to use such abilities, although there appears to be a move towards trying to explore this more, and a realisation that therapist mentalizing abilities should be "one step ahead of the patient" (Diamond et al, 2003, p227). Machado, Beutler and Greenberg (1999) found therapists were more able to detect emotional information across videotaped and transcribed psychotherapeutic sessions. However, the control group of undergraduate psychology students were not particularly well-matched in this case. Conversely, Hassenstab et al. (2007) found that therapists scored no differently to a well-matched control group on the cognitive aspects of empathy when observing facial expressions or in the Eyes Task (Baron-Cohen et al. 2001). Diamond et al. (2003) considered therapist mentalizing in the context of the therapeutic dyad and conceptualised both therapist and client mentalizing in therapy as a bidirectional process which was mutually and reciprocally influential, but made no conclusion as to therapists' abilities per se.

Other than this, empirical research in therapist mentalizing abilities is hard to locate. Nonetheless, there have been attempts to understand mentalizing in other groups that may arguably possess some similarities with therapists. For example, Dziobeck et al., (2005) attempted to explore whether a group of psychics had superior abilities in mentalizing using the Eyes Test (Baron-Cohen et al., 2001) and the IRI (Davis, 1983). They found superior abilities on only one scale (Fantasy) of the IRI, which did not support their hypothesis that psychics would show better mentalization abilities overall. Interestingly, they highlight that many psychics reported not having face-to-face contact with clients, which is clearly different to the experience of therapists. The authors suggest that similar research might be undertaken with psychologists, therapists or social workers as potential experts in mental state understanding.

In other groups, an interesting study was undertaken that explored the tendency to mentalize (i.e. display mind-mindedness in talk) in describing children's behaviour in a group of childcare practitioners (Degotardi & Sweller, 2011). Mentalization was found to be significantly related to practitioner sensitivity, with implications for the provision of developmentally supportive

experiences for children. Finally, Goldstein and Winner (2012) recently tested a hypothesis that experience and training in acting, a perspective taking activity, leads to growth in empathy and ToM. They found significant improvements in cognitive empathy measured by a self-report scale (Basic Empathy Scale, Jolliffe & Farrington, 2006) and in performance in the Eyes Task (Baron-Cohen et al. 2001) following acting training and suggest that this demonstrates definite plasticity in empathic and mental state abilities in adulthood.

This study aims to replicate and extend some of the above research by exploring specifically not only the empathic abilities but also the broader mentalizing capabilities of the therapists utilising the measures already explored, i.e. the IRI and the Eyes Test, but also several alterative measures of mental state understanding and production, such as mental state talk and social orientation. So far, these aspects remain unexplored in therapists.

## 4. The relationship between attachment and mentalizing

Research on theoretical and empirical associations between attachment and mentalization has been influenced primarily by the work of three individuals: Elizabeth Meins, Arietta Slade and Peter Fonagy. The capacity to take a psychological perspective on another has been variously termed as mind-mindedness, insightfulness and reflective function, and these overlapping attributes reframed in a psychotherapeutic literature appear fundamentally significant to both secure attachment and mentalization (Sharp, Fonagy, & Goodyer, 2006).

### 4.1. Emotion processing

As has been seen, children with secure attachment relationships appear to do better than those with insecure attachment relationships on tests of emotional understanding. For example, Fonagy et al. (1997) showed that security of attachment in preschool children was a significant predictor of emotion understanding, even when verbal mental age, social maturity and chronological age are controlled for. Further, Fonagy, Steele, Steele and Holder (1997 – check ref) found that 82% of secure children passed a belief-desire reasoning task at five and a half years old compared to 50% of those who were avoidant, and fewer still in other attachment categories.

## 4.2. Mentalizing

In the typically developed child, the relationship between mentalizing and attachment appears to be predictive, but it is unknown if this pertains in adults. Similar patterns might be expected, but as yet, this area of adult mentalizing remains unexplored.

### 4.2.1. Attachment and mind-mindedness

As touched on previously, the concept of mind-mindedness has been explored both in terms of its potential effect on security (see section 2.1.3.2) and on the ability to mentalize (see section 3.3.8.1). In a series of studies Elizabeth Meins and colleagues examined the mechanisms and associations between maternal mind-mindedness, security of infant attachment and mentalizing abilities. Mind-mindedness is defined as a mother's propensity to treat her individual child as a mind rather than as an infant with physical needs. They propose that mothers' mind-mindedness contributes to affect regulation and attachment security since mind related comments by mothers predicted attachment security at 12 months (Meins et al., 2001), mentalizing capacity at 45 and 48 months (Meins et al., 2003), and stream-of-consciousness performance at 55 months (Meins et al., 2003). They also found that the effect of mind-mindedness was independent of the contribution of maternal sensitivity to attachment security, although this has been challenged by a later study that found maternal sensitivity did mediate the relationship between mind-mindedness and infant attachment (Laranjo et al., 2008).

Recently, Meins and colleagues also assessed alexithymia in adults and its association with attachment and mind-mindedness (Meins, Harris-Walker & Lloyd, 2008). Alexithymic individuals have difficulty in identifying and describing emotions, although they show normal physiological responses to emotion, which suggests that alexithymia is a deficit in the cognitive processing of emotions (Luminet, Vermeulen, Demaret, Taylor, & Bagby, 2006). Whilst there is a growing body of evidence that secure attachment style is associated with lower levels of alexithymia (e.g. Hexel, 2003), the mechanisms remain obscure. Meins et al. (2008) found that lower attachment avoidance was associated with greater mind-mindedness, and both high avoidance and higher anxiety with a greater degree of alexithymia. Mind-mindedness mediated the relationship between attachment avoidance and alexithymia, specifically the tendency to decide not to explore emotion cognitively.

### 4.2.2. Attachment and reflective functioning from childhood into adulthood

As introduced briefly above on the issue of maternal responsiveness (see section 2.1.3.3), Fonagy and colleagues have conceptualised 'reflective functioning' as being intricately linked to attachment security. Reflective function refers to the capacity to envision mental states in oneself and another, and to understand one's own and another's behaviour in terms of underlying mental states and intentions. Fonagy et al. (2002) describe mentalization as a basic human capacity linked to affect regulation and productive social relationships. The more a person can envision mental states in the self and others, the more the person is likely to engage in productive and intimate social relationships with others, to feel connected to but autonomous from others, and possess a secure attachment. They see failure to engage with the minds of others or one's own mental experience is a sign of insecure attachment. Fonagy's research demonstrates that adults who are able to reflect and mentalize about themselves and their parents when asked about their childhood relationships are more likely to be secure (Fonagy et al., 1995). Conversely, failures of mentalization have been linked with psychological disorders such as BPD and others in which patterns of insecure attachment are indicated (Fonagy et al., 2002; Fonagy et al., 2008).

Reflective function is clearly related to mind-mindedness inasmuch as they both consider the mother's or carer's capacity to treat the other as a psychological agent. They differ, however, in operationalization in that the measurement of mind-mindedness by Meins and colleagues has been in the evaluation of real-life interactions between parent-child dyads, whereas the Reflective Function Scale (Fonagy et al., 1998) assesses responses to childhood attachment questions on the AAI that require reflection on or observation of complex mental states in the self and others.

Fonagy's related concept of mentalization-based therapy is rooted in the psychoanalytic understanding of emotional functioning. The concept of an enhanced mentalizing capacity through mentalization-based therapy is considered by many to capture what actually shifts or changes in effective clinical work (Allen, 2006; Slade, 2008). Mentalization-based therapy has become an empirically validated form of treatment for many clinical presentations and the Reflective Function Scale has become a successful tool as an outcome measure in many presentations (Fonagy et al., 1996; Fonagy et al., 2002). Mentalization-based research is designed to develop a capacity for mentalization, and reflection on mentalization, provoke thought about the mental states of others, and clarify and label emotions (Allen 2006; Bateman & Fonagy, 2004; Fearon, Target, Sargent,

Williams, McGregor, Bleiberg et al., 2006; Fonagy, 2006). In the same way that a secure mother-child attachment relationship promotes mentalization, so a secure therapeutic dyad is believed to promote mentalizing in psychotherapy (Allen, 2006). Whilst other therapies may well address similar affective issues, it is mentalization therapy that is focussed on the dynamics of attachment-related defences (Slade, 2008).

In sum, in children, the relationship between mentalizing and attachment appears to be predictive, but it is less well-known how this relationship operates later in life. Fonagy's work has examined the association between secure attachment behaviours and mentalization capacities in adults and suggests that therapy can have a positive influence on the mentalizing capabilities of clients which in turn can lead to a more secure attachment orientation. However, there remains a shortage of research concerning specifically the attachment/mentalizing relationship in therapists which, given that the therapist is crucial to mentalization in therapy and to a secure attachment dynamic in the therapeutic dyad, seems to be a particularly important area of psychotherapeutic research.

#### 4.2.3.The relationship in therapists

Empirical quantitative research into associations between attachment and mentalizing in therapists does not exist. Rizq and Target (2010a) have come closest to addressing this research vacuum by observing that a group of twelve Counselling Psychologists exhibited a broad range of Reflective Function scores, with higher scores tending to be related to more secure/earned secure AAI classifications. However, whilst their study contributes to existing knowledge, Rizq and Target (2010a) made no claim as to generalizability, and the small sample size, qualitative analysis, and principal emphasis on personal therapy experiences means a fuller quantitative focussed analysis is overdue.

Some studies have considered similar groups. Padykula and Horwitz (2011) recently explored how social work training and attachment may be associated with two aspects of mentalization: reading non-verbal communication and reflective thinking. They found that regardless of the amount of training undertaken, students with an insecure attachment orientation had significant deficits in non-verbal mentalizing abilities (as measured by the Eyes Test; Baron-Cohen et al. 2001). Social work training also influenced the use of reflective thinking as measured by the Levels of Reflective Thinking Questionnaire (Kember, Leung, Jones, Loke, McKay, Sinclair at al., 2000). Reflective thinking in this case was greater for insecurely attached students which the authors suggest reflects the need of the insecure student to overcome an internal working model associated with their

historical attachment style. They point out the obvious implications of this in terms of the influences of previous attachment experiences on the educational practice objective of the development of empathic and other mentalization skills.

## 5. Summary of Questions and Relevance

Despite the fact that therapists are required to act as the "secure base" in the therapeutic relationship, previous research suggests that the percentage of securely attached therapists in any group resembles a value similar to the general population at 60-70% (Leiper & Casares, 2000; van Ijzendoorn & Bakermans-Kranenburg, 1996). Whilst attachment security in therapists and control group members was not the major focus of this study per se, attachment styles of both were measured in order to explore the primary focus of this study, i.e. the effect of attachment on mentalizing. It was not expected that the therapists as a whole would be more secure than non-therapists and comparable profiles were expected in each group.

It is known that previous research suggests that therapists think they are better at some aspects of mentalizing than other people, for example, in the understanding of emotions, and in the possession of a greater empathic ability (e.g. Hassenstab, et al., 2007) although this view is often arrived at via self-report measures (e.g. Hall, et al., 2000). The expectation in this study was that the therapists would replicate previous studies and exhibit some aspects of mentalizing, such as empathic understanding, that were more advanced than the control group.

The existing literature does not allow a highly informed assessment of what to expect in other areas of mentalizing, for example, more complex mental state understanding, perspective taking or in the production of mental state talk or the proclivity to use mental state terms. This represents one of the key areas of research in this study. However, given the enhanced self-reported abilities in empathy, and the extent of the training that therapists have undergone in the understanding of emotional states as presented by their clients, one might expect a better performance in all or at least some of the more complex and subtle aspects of both mental state comprehension and particularly in the proclivity to use mentalizing ability. The battery of tasks aimed at understanding these different aspects of mentalizing, including eye-tracking technology to focus on the processing of socio-perceptual information should allow a far more considered exploration of these issues than has so far been possible.

Finally, it is known that mentalizing abilities and attachment styles are significantly related in children, the more securely attached child being able to mentalize and pass false belief tasks earlier. In adulthood, less is known, but there is some evidence that a greater mentalizing capability is correlated with more secure attachment-related behaviours and lack of mentalizing ability is

correlated significantly with various maladaptive insecure behaviours and psychopathology (e.g. Fraley & Shaver, 2000; Fonagy et al., 2002; Fonagy et al., 2008; Mikulincer & Shaver, 2007). Therefore in this study, the control group might be expected to exhibit the types of behaviours associated with the general adult population, for example, avoidantly attached individuals might shy away from emotionally charged stimuli, or anxiously attached individuals might ruminate on negative emotion. What is less clear is whether therapists will exhibit the same, given that they spend much time habitually inhibiting their own emotional perspective in order to serve their clients well. It is suggested that therapists may display a different profile, with one possibility being that the effect of attachment may perhaps not be quite so pronounced as that which would be expected in the general population.

To recap this study's question, does attachment affect mentalizing in therapists in the same way as those without their background and training? Or are there inconsistencies in how attachment styles are *managed* and allowed to influence human interactions? The answer to these comparatively new questions should hold significant interest for therapists concerned with the quality of their relational skills and their ability to connect with their clients. First, any information that sheds light on how a therapist can improve his or her practice through awareness of the dynamic between therapist and client must be highly valuable in a professional and ethical context. Second, a more thorough understanding of therapist attachment issues and how these may affect the mentalizing abilities of therapists should be useful to institutions and organisations charged with training effective and conscientious therapists, and indeed professionals within other helping and caring spheres. Third, mentalization research both in general terms, but also in the context of psychopathological interventions, can benefit from understanding much more about on-going mentalizing in adults, and whether enhancements to mentalizing can be experienced in a situation where significant training in mental state understanding has been undertaken.

## METHOD

*Design*

The study employed an experimental and questionnaire design. The experimental component included computer-based tasks, some of which also involved the use of eye-tracking and visual and verbal recording equipment. Variables were analysed using correlational and between subjects analysis. The key approach to the analysis was to have a range of mentalizing tasks. Though in total this constituted quite a large number of tasks, the aim was to explore each domain of mentalizing separately through measures specifically designed for and targeted at each domain i.e. self-reported, behavioural, production and eye-tracking measures of mentalizing. Thus, while this inevitably leads to a fairly large number of statistical comparisons, within each mentalizing domain the number of comparisons is more limited.

*Participants*

There were two groups of participants: "Therapists" and "Non-Therapists". In the therapist group, there were 20 participants ranging in age from 28 to 60 years (mean age = 38.7 years; 13 women and 7 men). One participant's data was discarded due to his age being in excess of 60 years. 17 participants were of White ethnic background, the remaining three being Chinese and Asian Indian. Participants were all practising and either possessed a counselling, counselling psychology or psychotherapeutic qualification at the level of Masters or Doctorate, or they were approaching the end of their professional training and had already amassed significantly over 500 hours of client contact. Appendix 1A shows the detailed qualifications and experience levels of the Therapist group. In the non-therapist group, there were 21 participants ranging in age from 37 to 51 years (mean age = 44.7 years; 16 women and 5 men). Ethnic background was again predominantly White or White European (17), with four Chinese, Asian or Black participants. Participants possessed a range of post-graduate/professional training qualifications as detailed in Appendix 1B. Groups were therefore well-matched for age, gender make up, ethnic background and education levels.

Participants were recruited through a variety of methods. For therapists, participants received either a recruitment mailshot sent out via the British Psychological Society, which approved the recruitment through its membership list, or a direct email approach from the researcher introducing the study with a request to consider participating. Non-therapists were targeted through recruitment posters and direct e-mails. Participants were offered £20 in vouchers, which was approved as part of the study's ethical approval and follows university guidelines on participant payment. Receipts for the vouchers were signed by participants.

*Ethical considerations*

The project was approved by Roehampton University's Ethics Committee (ref no. PT 09/024, see Appendix 2) and adhered to the British Psychological Society's Code of Ethics and Conduct guidelines (BPS, 2009). Ethical considerations included ensuring participants read and signed an informed consent (see Appendix 3). Confidentiality was ensured and maintained with use of participant identification numbers. Raw data is securely stored in a locked cabinet in the Social Developmental Laboratory at Roehampton University. Data will be kept for at least 10 years, according to university guidelines. No identifying information is included in any process data file or the written report. Participants were assured of their right to withdraw from the study at any time and were given an identification number to facilitate this if necessary. A written debrief (which differed slightly depending upon which group the participant was part of) was given at the end of the study. These also appear at Appendix 3.

*Materials and procedure.*

Participants undertook the study individually in a suite of rooms in the Social Developmental Laboratory at Roehampton University. After initial invitation, participants were introduced to the study using the consent form which was signed by the participants and which included a brief description of the research questions, tasks and ethical framework. They were provided with verbal and written instructions by the researcher at the beginning of each task. Data was collected using a task specific procedure and is detailed in each task description below. Some tasks required written or verbal responses, and some were audio and visually recorded. If the task was computer based, clear instructions were provided as to what technology was being used e.g. eye-tracking equipment or visual recording of the participant. Participants were alerted at the point at which either visual or audio recordings began. Participants were also given advice on how to position themselves comfortably at the screen during the computing tasks. Stimuli and response sheets were provided where needed.

The tasks (detailed further below) were completed in the following order:

(i) Demographic Questionnaire.

(ii) Eye-tracking tasks: Everyday Pictures (two different orders of pictures were used, counterbalanced), followed by Facial Emotion (two different orders of faces were used, counterbalanced also). Whilst participants' eye movements were tracked during the Facial Emotion task, this particular data was not used in this study due to the scope of the study and constraints on volume of data to be analysed, but the task was undertaken as part of the eye-tracking battery.

(iii) Behavioural tasks: Perspective Taking task, followed by the Eyes Test/LEAS counterbalanced.

(iv) Self-report tasks: ECR/EQ/AQ/IRI counterbalanced.

The tasks and questionnaires took approximately 75 to 90 minutes to complete for each participant. The responses were then coded where necessary and scored according to the criteria outlined above. Coding for each of the Everyday Pictures and LEAS was checked for accuracy by a colleague.

1. *Demographic Questionnaire.*

A demographic questionnaire collected demographic information including age, gender, and family background including siblings' ages, parents' education and occupations. Details of qualifications were obtained together with preferred therapeutic model and approximate number of client hours for therapist participants. Participants were also asked if English was their first language. Following Ruffman et al. (2002), responses for mothers' or fathers' education were subsequently graded as follows; 0 = no formal qualifications, 1 = non-GCSE qualification, 2 = GCSEs, 3 = A levels, 4 = further qualification, non-degree, 5 = undergraduate degree, 6 = postgraduate qualification. The mean of the educational level when was computed for both parents. Occupation was graded according to the Standard Occupational Classification (Office of Population Censuses and Surveys, 1991), as follows: 1 = professional, 2 = managerial, 3 = skilled, manual or non-manual, 4 = semiskilled, 5 = unskilled. If a parent was not working or at home with children or where a parent was retired or deceased, the most recent occupation was scored. When all socio-economic categories had been scored, mothers' and fathers' education and occupation were then totalled and divided by four to give a mean socio-economic score. The full questionnaire is appended in Appendix 4.

*BEHAVIOURAL MEASURES*

2. *Everyday Pictures* (Ruffman et al., 2002).

This task was used as a measure of mental state talk. It employs a number of everyday pictures modified from a set first used by Ruffman et al. (2002). They are used to study the range of emotional and other mental state language used by participants. The pictures consist of seven colour photographs showing emotional or mentalistic situations (e.g. a man trying to kiss a woman, a woman with a child struggling on a high bridge). Two sets of the pictures were used, each set containing the same pictures but in a different order of presentation, and the sets were counterbalanced in the testing. Examples can be seen in Appendix 5. The pictures were presented sequentially on a computer screen, one on each screen. Participants were instructed to describe verbally the contents of each photograph "as if describing it to someone who could not see it". Participants' responses were recorded using an audio recorder and a webcam. Participants' eye movements when describing the pictures were recorded using the eye-tracker (see task description 3 below). There was no time limit for describing the picture. Participants pressed a button on the keyboard to move onto the next picture when they had finished. On average, participant recordings lasted approximately 7½ minutes (about 5 hours of

material in total) and ranged from two to 24 minutes long. These were then transcribed in detail by the researcher.

Transcriptions were initially coded for 5 different types of mental state language used: *Cognitive* (e.g., think, believe, curious), *Desire* (e.g., want, wish for), *Emotion* (e.g., terrified, happy, embarrassed), *Physical Cues* (e.g., grimacing, smiling) and *Care* (e.g., concerned for, comforting). For repetition, where the participant repeated a mental state word over again pertaining to the same character and context, the word was scored once. Where it appeared a second time either in a different context for the same person, or pertaining to another person in the situation, it was scored separately. See Appendix 6 for a full list of mental state words coded in all transcripts. Transcriptions were also separately coded for the *range* of mental state words used, taking into account repetition (for example, where a participant used "angry" three times and "sad" once, a score of only two would be recorded, but where four different mental state terms were utilised, the full score of four would be recorded.) Modulations of assertion such as "probably", "might" and "maybe" were also coded (again, see Appendix 6 for modulation words). Finally, elaborative talk was also coded using a scheme similar to that employed by Slaughter et al. (2007) for clarifying talk. Elaborative talk took several forms (with examples from the transcripts):

(i) causal or explanatory talk explicitly making statements about an attributed cognitive, affective or perceptual mental state term e.g. "they are cross *about* the fact that…..", "her face is screwed up *as if* this is pretty grim", or "they are happy *that* they've have got the bread";

(ii) explanations for the sources of knowledge, e.g. "it's not clear whether she knows that the other girl is looking" or "they're trying to work out how, what's going on, why is this baby crying".

(iii) talk noting discrepancies between different characters mental states, contrastive mental states in one character, or discrepancies between mental states, perceptual realities and physical reality, e.g., " She's not wanting the kiss, but he looks quite happy about it", "can't work out whether she's teasing him or if she's really actually repulsed", " the son is not interested but probably he's listening anyway", or " it looks like nothing has happened''.

See Appendix 7 for an example of a finally coded and scored transcript including mental state terms, modulations of assertions and elaborative language.

3. *Eye-tracking measures of social orientation (social stimuli).*

The Everyday Pictures task was also used as the stimulus to measure differences in social orientation. The eye-tracking data was collected at the same time as participants were undertaking the verbal description of the photographs in the above mental state language exercise, using a 120 Hz video-based infrared eye-tracking camera (Tobii T120, Tobii Systems). The eye-tracking camera is non-invasive, safe and unobtrusive, and allows the participant to move freely as there is no constraint to the head. Participants are able to wear spectacles if they need to without compromising the effectiveness of the eye-tracker. Stimulus material was presented on a 20" monitor, using Tobii Studio software, and the eye-tracking camera was placed underneath the monitor of the stimulus PC, and angled up at the participant at the correct angle to ensure maximum recording. The seating arrangement and the angle of the eye-tracker were moved if necessary to ensure the maximum efficiency in picking up the signal. A calibration exercise was run for each participant and for each task to ensure sufficient and continued accuracy. The camera captured participants' eye movements through tracking the centre of the pupil and the corneal reflection, and the connected PC running Studio software digitally stored participants' gaze for further analysis. On screen area was divided into face, hands and non-social stimuli and digital video tapes of the eye movements were coded for each area of these areas of interest for each participant. Figure 1 below shows a picture with areas of interest for coding. The total amount of recording time was approximately 5 hours. Two main measures of looking time were recorded: total duration of looking time, and duration of first look, both in milliseconds.

Figure 1. Example of Everyday Picture with areas for coding of eye movements marked.

4. *Recognition of Facial Emotion Task (Emotion Understanding),* (Ekman & Friesen, 1971; 1975).

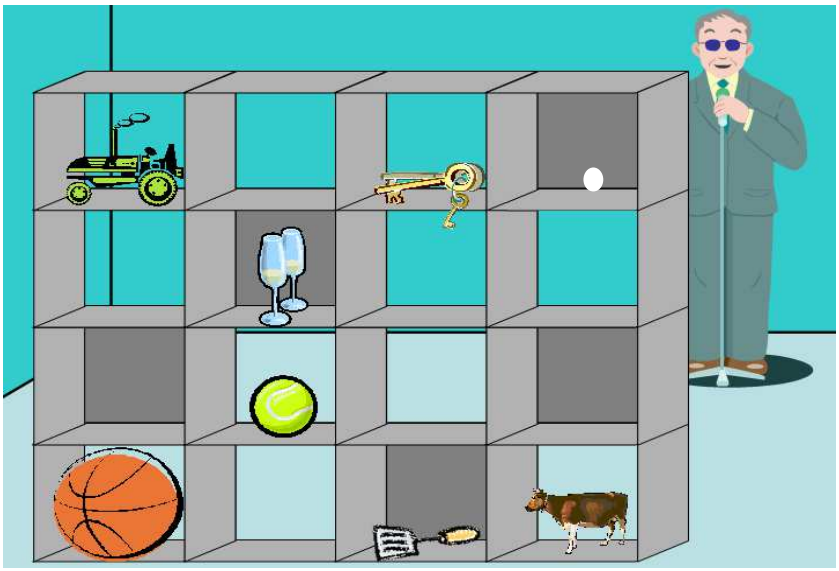
In this measure of emotion understanding, participants were presented with twenty four PowerPoint slides on a computer screen, each depicting a photograph of a male or female face, showing a version of one of six basic facial emotions each with a blank slide interspersed. The emotions were sadness, disgust, fear, anger, happiness and surprise. The photographs were presented in the middle of a computer screen with the six emotion words printed below it. Participants were required to choose the emotion word which best matched the emotion being shown on the face, and to say the word out loud at the same time as pressing a keyboard button to move onto the next screen. There then followed a blank slide. Participants were free to answer in their own time but were encouraged to be as fast and accurate as possible. A further press of the key moved the screen onto the next photograph. Two practice screens were presented before the main task started. Participants' responses were recorded manually by the researcher and also by the using the voice recorder and webcam. Participants received one mark for each correct emotion identified, resulting in a maximum score of 24. See Appendix 8 for an example of the facial emotion stimuli.

5. *Perspective Taking Task* (Keysar et al., 2000; Wu & Keysar, 2007).

A computer based perspective taking task, modified from Keysar et al. (2000) by Apperley, Carroll, Samson, Qureshi, Humphreys, & Moffatt (2009) was used to measure both accuracy and speed of responding when taking another's perspective. The instructions to the participants explained that they would see a grid on the computer screen comprised of various slots in which there were objects. They were told that a director was behind the grid, and a number of the slots are covered from his point of view such that he cannot see the objects in those slots. Participants were shown a picture of the grid from their own perspective and also one of the same grid from the perspective of the director. They were informed that the director would ask them to move objects around the grid by clicking on them with a mouse and dragging them to the appropriate slot. They were asked to do this as quickly and as accurately as they could. The participants are openly informed that the director cannot see some objects and that they should try to take his perspective into account. After listening to the experiment instructions, they are given four practice grids before the main task. The main task comprises of 128 trials (instructions) to move objects. In 16 cases the director asks them to move one of a number of similar objects (e.g. football, tennis ball, golf ball), one of which is occluded from his perspective. In this particular example, the director asks the participant to move the smallest ball down one slot. To take the director's perspective correctly the participant must choose to move the tennis ball, which is the smallest ball for the director, rather than the occluded golf ball, which is the smallest ball for the participant (see Figure 2 below). The data records, through the mouse movements, whether the participant has attempted to move the object that

the director cannot see, or the one that they can both see and the time taken to make the decision. The data recorded by the computer provided an accuracy score out of 16 and also a reaction time measure of the correct responses.

Figure 2. Example of perspective taking grid seen by participant.



6. *The Levels of Emotional Awareness Scale* (LEAS, Lane et al. 1990)

The LEAS is an open response measure that asks the participant to describe how they and another person would feel in each of 20 described interpersonal scenarios. It has a structured scoring manual (Lane, 1991) which evaluates emotion differentiation and awareness of emotional complexity in the self and other through the number of emotional words used in the response. Due to study time constraints, the LEAS-A scale was used, which reduces the number of scenarios to 10. The 10 scenarios appear in Appendix 9. The LEAS scenarios were presented in hard copy at the top of a page of A4, and participants were asked to give answers verbally which were recorded using an audio recorder. The length of participant recordings ranged from 4 to 24 minutes each and on average lasted approximately 13 minutes (about 8½ hours of material in total). These were then transcribed by the researcher and scored for language use.

The written narratives to each scenario are scored between 0 and 5 corresponding to levels of emotional awareness separately for the self and other as follows: level 0 – only thoughts/actions described; level 1 – physiological cues are described e.g. tired; level 2 – undifferentiated emotion is described e.g. bad, good; level 3 – the recording of a differentiated emotion e.g. angry, elated; level 4 – two or more level 3 words are used that can be differentiated from each other; level 5 – where both self and other are rated as level 4. The

higher of the two levels for self and other is scored as the total for the scenario, the scenario scores being summed for the total. A maximum score of 50 is possible.

7. *The Revised "Reading the Mind in the Eyes" Test* (Baron-Cohen et al., 2001).

This test ("the Eyes Test") assesses the ability to infer the mental state of a person solely from the information provided in a picture of the person's eyes (i.e. it measures the social-perceptual aspects mental state understanding). It consists of 36 grey scale photographs of the eye region of male and female faces (in equal number) presented one at a time. The eyes depict complex mental states such as "despondent", "preoccupied", "cautious", or "regretful". Each eyes picture is presented with four words (one target adjective and three foil adjectives) from which the participant is asked to pick the target word to match the expression portrayed in the eyes i.e. that best describes what the person is thinking or feeling. A glossary of all the mental state terms used may be referred to by participants. The subtlety in the test is provided by the similarity of the foil words to the target word, and there are no reported ceiling effects (Baron-Cohen et al., 1997; Baron-Cohen et al., 2001). The participants were given a ring binder with the 36 Eyes Test photographs which they viewed one by one, noting their answers on a score sheet. Participants can receive one point for each correct answer with a maximum of 36. Participants' responses are classified as correct or incorrect according to an ideal response set established on the basis of judgement consensus in a pilot study conducted by Baron-Cohen et al. (2001). Examples may be seen in Appendix 10.

*SELF REPORT MEASURES*

8. *The Experiences in Close Relationships Scale* (ECR; Brennan et al, 1998).

The ECR is a self-report measure which gives a score for two orthogonal dimensions of attachment: avoidance and anxiety. The 36 item ECR was developed from the responses of undergraduate students to 300 items taken from frequently used attachment measures, for example, "I worry about being abandoned" or "I get frustrated if romantic partners are not available when I need them". Brennan et al. (1998) reported internal consistency reliabilities (Cronbach's alpha) of 0.91 and 0.94 respectively for the two subscales. Each subscale contains 18 items which are rated using a seven point Likert scale ranging from disagree strongly to agree strongly and some items in both subscales are reversed. See Appendix 11 for the full measure. Responses are computed to give coefficients for each of the subscales which also allow assignment of each participant into one of four attachment groups: secure, fearful, preoccupied and dismissive (which were not used as the two dimensions of anxiety and avoidance were considered to be more appropriate for the measurement of group differences and interactions at group levels). Two studies have reported significant retest reliability, first over three weeks (.70 for both scales reported by Brennan, Shaver & Clark, 2000) and subsequently over six

months (.68 for Anxiety and .71 for Avoidance reported by Lopez & Gormley, 2002). In addition, results of Item Response Theory analysis have shown that a relatively good degree of measurement precision is afforded by the ECR in comparison with some other self-report inventories (Fraley et al., 2000).

9. *Interpersonal Reactivity Index* (IRI; Davis, 1980*)*.

The IRI is a self-report questionnaire that measures individual differences in cognitive and affective components of empathy. The 28 item measure includes four seven item subscales: Perspective Taking, PT, (cognitive), assessing the tendency to spontaneously shift perspective and adopt the viewpoint of another e.g. "I believe that there are two sides to every question and try to look at them both", Empathic Concern, EC, (affective), assessing the respondents' feelings of warmth and concern for others, e.g. "I often have tender, concerned feelings for people less fortunate then me", Fantasy, FS, measuring the individual's tendency to imaginatively transpose oneself into fictional situations, e.g. "I really get involved with the characters in a novel", and Personal Distress, PD, assessing the respondent's own feelings of fear and discomfort on witnessing negative experiences of others, e.g. "I sometimes feel helpless when I am in the middle of a very emotional situation." The first two subscales were considered by Davis (1980) to represent the most advanced levels of empathy. The statements are rated on a five point Likert scale ranging from (0) does not describe me well to (4) does describe me well. The original validation study for the IRI found internal consistency estimates ranging from 0.68 to 0.79 (Davis, 1980). More recently, Christopher, Owens and Stecker (1993) found reliability estimates ranging from 0.73 to 0.76 for 3 of the 4 subscales (EC = 0.73, PD = 0.73, PT = 0.76). The full list of IRI items can be found at Appendix 12.

10. *Empathy Quotient* (EQ; Baron-Cohen & Wheelwright, 2004).

The EQ, a self-report empathy measure, was designed to have a clinical application and to be sensitive to a lack of empathy as a feature of psychopathology. It was validated on 197 healthy controls and 90 people with either Asperger's Syndrome or high-functioning autism, and was shown to distinguish well between the two. It consists of 40 statements to which participants have to indicate the degree to which they agree or disagree. There are four response options: "strongly agree", "slightly agree", "slightly disagree", and "strongly disagree". Answers are scored 1 or 2 for the extent of agreement with an empathic response. Non-empathic responses are scored at zero. The maximum score is therefore 80. The authors suggest that scores within the range 33-52 indicate "average" levels of empathy, scores lower than 33 represent low empaths, and scores above 52 represent high empaths. Several studies have investigated the EQ's validity and have reported high re-test reliability and moderate to

high correlations with other self-report and observable indicators of empathy (e.g. Lawrence et al., 2004). The full EQ appears at Appendix 13.

11. *A self-report measure of general social and cognitive ability* (The Autism Quotient, AQ; Baron-Cohen et al., 2001).

    The AQ is a self-report 50-item questionnaire designed to assess the degree to which adults of normal intelligence show five different traits associated with the autistic spectrum: social skill, attention shifting, attention to detail, communication, and imagination. Higher scores on the subscales indicate more pronounced autistic traits in these areas. It was administered in this study in order to identify any general social and cognitive differences between the groups and to ensure the groups were well matched. Responses are made on a four point scale: definitely disagree, slightly disagree, slightly agree, and definitely agree. Scoring was undertaken according to two different protocols. In the original scoring system (Baron-Cohen et al., 2001) items are scored as 1 for a response in the "autistic" direction and 0 for a "non-autistic" response with a maximum score of 50. In the scoring system favoured by Austin (2005), scoring is undertaken treating the responses as a four-point Likert scale reverse keying where necessary so that each item is scored 1,2,3 or 4, with a maximum score of 200. This method allows the degree of endorsement of each item to yield discriminating information and is the system used in this study. Internal consistencies at the time of development were reported as follows: social skill, .77; attention shifting, .67; attention to detail, .63, communication, .65; imagination, .65. Various evaluations of the factor structure of the AQ have been undertaken (e.g. Kloosterman, Keefer, Kelley, Summerfeldt & Parker, 2011; Stewart & Austin, 2009).

As part of the completion of the above tasks, certain data was collected that is not analysed or referred to in this study. Primarily this is because the scope of the study and the timing and word length constraints of a PsychD did not allow analysis of the additional data. However, future studies may wish to consider this. Examples of unused data available include eye-tracking data of participants' eye movements and latency times during the Emotion Faces task, time to first emotion words used in Everyday Picture tasks and full transcripts which would allow coding for appropriate and inappropriate mental state language use.

## RESULTS

### 1. Preliminary Analysis and Descriptive Statistics

Descriptive statistics appear in Tables 1 to 7 below.

Z-scores for each measure were analysed for outliers by highlighting standardised scores of ± 3. Total sample z scores showed that Participant 1 had scored very highly on Elaborative mental state talk, and Participant 31 had recorded a particularly low score on the facial emotion task. In addition, participants 14, 31 and 52 were outliers for cognitive and emotion mental state words respectively within the total mental state word score. In each of these cases, scores were trimmed to one above or below the next highest or lowest score, following Wilcox's (1992) recommendation to trim outlying data and distributions with heavy tails in order to safeguard power.

Following this, the two groups were further checked for outliers within the groups. Data for the therapist group showed no further outliers. Data for the non-therapist group showed that the facial emotion score for Participant 31 was a marginal outlier (score of 14, z score of -3.1). However, because this score had already been subject to the trimming exercise for the whole data set, and represented only 1 correct answer less than the next highest score of 15, the decision was taken to keep this score at its original trimmed value.

Distributions for the main variables of analysis following the trimming exercise were analysed by observing values for skewness and kurtosis. Tests of skewness and kurtosis are often overly sensitive (Pallant, 2007) and skewness should not make a substantive difference in the statistical analysis providing sample size is adequate (Tabachnick & Fidell, 2007). Tabachnick and Fidell (2007) therefore recommend inspecting the shape of the distributions using histograms so give a feel for whether undue levels of skewness or kurtosis exist. Histograms for the main variables appear at Appendix 15. An observation of the histograms suggests Avoidant Attachment and Perspective Taking Task accuracy scores required further normality analysis.

Normality analysis was undertaken for the main variables using the Shapiro-Wilk Test of normality which is sensitive for a range of sample sizes, in particular for smaller sample sizes of around 20 participants (Shapiro & Wilk, 1965). The normality test output appears at Appendix 16. Avoidant attachment did not produce a significant result so was accepted as a normal distribution. All other main measures did not significantly differ from normality with the exception of the following. The accuracy scores in the Perspective Taking task, Emotion Faces score, Total Eye Fix time on Social Information, and Elaborative Talk showed a potential violation

of normality (the latter very marginal). Therefore, a correlation analysis was run using Spearman's rho instead of Pearson's r to explore the potential difference in results for the main variables. No major difference in strength of correlation values or significance was seen. Skewness and kurtosis for Emotion Faces, Eye Fix time and Elaborative talk were satisfactory. Given all the above and the accepted normality of most variables, parametric tests were used on the data throughout the analysis. For completeness, however, the Spearman's analysis on the main variables can be seen at Appendix 17.

*1.1 Gender, English as a first language or age effects*

Chi square tests were undertaken to assess whether the proportion of male and female participants, or English as a first language differed between participant groups. Table 1 shows the raw data.

Table 1. Gender and English as a First Language data.

| | Therapists | Non-therapists | Total |
|---|---|---|---|
| Gender | | | |
| Male | 7 | 5 | 12 |
| Female | 13 | 16 | 29 |
| English first language | | | |
| Yes | 17 | 21 | 38 |
| No | 3 | 0 | 3 |

The Pearson Chi-Square test for independence for gender (with Yates continuity correction for a 2x2 table; Pallant, 2007) was not significant, $\chi^2$ (1, n=41) = 0.20, p=0.66, phi=0.12., and therefore distribution of males and female was comparable. Gender was therefore not considered further in the analysis. A Pearson Chi-Square test for English as a first language also showed non-significance, $\chi^2$ (1, n=41) = 1.55, p=0.21, phi=-0.29. However, for two cells the frequency was less than five. Therefore to further check for potential effects, independent sample t-tests were carried out on the main variables for the two language groups. This appears at Appendix 18 but in summary no significant differences were seen with the exception of the first eye fix duration being significantly greater for participants for whom English was not their first language. To test for the relevance of this, partial correlations were undertaken to control for English as a First language in correlations between first eye fix durations and other variables. No material differences in the correlation coefficient profile were seen (see Appendix 19). Given this, and the fact that all other main variables evidenced no significance for language difference, language was not considered further in the analysis.

## 2. Group Differences

The descriptive statistics for each variable measured as part of this study appear in Tables 1 to 6 on the following pages. Tables also include independent sample t-test results to analyse for group differences between the therapists and the non-therapists.

### *2.1 Demographic profiles*

Three group differences were seen in the demographic characteristics of the two groups (see Table 2). First, there was a statistically significant difference between the ages of the two groups. Therapists had a mean of 38.7 years, and non-therapists 44.8 years, $t(24.24) = -2.55$, $p=0.018$. In the context of this particular study, it was felt that both means fell comfortably within the boundaries of an age group that could be described as cognitively mature adults, and that given the absolute ages concerned, a difference of 6 years in means should not have an undue effect. Further, correlations of age with scores on the main variables did not yield any significant correlations (see Appendix 20), nor did partial correlations differ materially from bivariate after taking account of age (see Appendix 21 for partial correlations). Therefore age was not considered further in the study.

The total number of siblings yielded significant group differences; $t(31.18) = -2.53$, $p=0.017$. Previous research (Ruffman et al., 1998) has suggested that the number of older siblings may have an impact on mentalizing ability, but in this case there was no difference between the groups in terms of number of older siblings, nor did number of older siblings correlate significantly with any of the measures, therefore it was decided that the difference between total number of siblings would not be considered material.

The combined variable of socio-economic background showed no significant differences between groups; $t(39) = -0.47$, $p=0.64$.

Differences in self-reported general social and cognitive ability were then explored. For this the five subscales of the AQ were examined, which gives measures of both general social abilities (social skill, communication and imagination) and cognitive ability (attention switching, attention to detail). There was no overall difference ($t(39) = -1.33$, $p=0.19$), nor was there any difference in the subscales.

Table 2. Demographic characteristics of participants

| Measure | Therapists | | | Non-therapists | | | All Participants | | | t-test |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range | Mean | Standard deviation | Range | |
| Age (years) | 38.70 | 9.97 | 28 – 60 | 44.76 | 3.82 | 37 – 51 | 41.80 | 7.99 | 28 – 60 | t(24.24) = -2.55, p=0.02* |
| No. siblings | 1.50 | 0.51 | 1 – 2 | 2.10 | 0.94 | 0 – 3 | 1.80 | 0.81 | 0 – 3 | t(31.18) = -2.53, p=0.02* |
| No. older siblings | 0.75 | 0.79 | 0 – 2 | 1.24 | 1.04 | 0 – 3 | 1.00 | 0.95 | 0 – 3 | t(39) = -1.68, p=0.10 |
| No. younger siblings | 0.55 | 0.67 | 0 – 2 | 0.76 | 0.83 | 0 – 3 | 0.66 | 0.76 | 0 – 3 | t(39) = -0.89, p=0.38 |
| Socio-economic background | 4.16 | 0.90 | 2.25-5.33 | 4.29 | 0.90 | 3.00-6.00 | 4.23 | 0.89 | 2.25-6.00 | t(39) = -0.47, p=0.64 |
| General social and cognitive abilities (AQ, Austin scoring) | | | | | | | | | | |
| Total score | 97.60 | 14.25 | 73-130 | 104.33 | 17.83 | 69-144 | 101.05 | 16.34 | 69-144 | t(39) = -1.33, p=0.19 |
| Social skill | 17.15 | 4.56 | 12-27 | 19.71 | 5.15 | 11-29 | 18.46 | 4.98 | 11-69 | t(39) = -1.69, p=0.10 |
| Attention switching | 21.85 | 2.89 | 18-29 | 25.76 | 5.46 | 14-34 | 21.51 | 3.90 | 11-30 | t(33.4) = 0.54, p=0.59 |
| Attention to detail | 23.75 | 5.38 | 15-32 | 21.19 | 4.72 | 11-30 | 24.78 | 5.45 | 14-34 | t(39) = -1.12, p=0.24 |
| Communication | 17.00 | 4.27 | 11-26 | 19.24 | 4.89 | 12-32 | 18.15 | 4.68 | 11-32 | t(39) = -1.56, p=0.13 |
| Imagination | 17.85 | 4.63 | 11-26 | 18.43 | 5.48 | 11.29 | 18.15 | 5.03 | 11-29 | t(39) = -0.36, p=0.72 |

*p<0.05, two tailed.

In general terms, therefore, it was felt that the group of non-therapists represented a highly rigorous control group. The two groups appeared to possess extremely similar demographic and background characteristics and the level of the postgraduate qualifications taken as the criterion for inclusion in the control group is relatively high, summarised as follows: 3 doctoral level, 10 masters level, 6 postgraduate diploma. Further, the content of the qualifications are broad and reflect occupations in many fields including a significant representation in social or helping-orientated arenas, for example education and medicine. Indeed, due to the nature of the teaching profession, the group differences analysis was also run excluding the data from two control group members who are currently working as teachers in order to explore the effect this may have, but results were not significantly different from those reported below so these data were included. Given this, and the similarities between groups in terms of both socio-economic background and general social and cognitive abilities, it was felt that the two groups were highly comparable.

*2.2 Attachment and other self-report measures*

No significant group differences were seen in ECR avoidant or anxious attachment coefficients suggesting the attachment orientations of the individuals within the two groups was similar ($t(39) = -0.623$, $p=0.54$, $t(39) = 0.70$, $p=0.49$ respectively, see table 4). A Pearson Chi square test was also run to explore attachment difference by analysing the proportion of ECR attachment categories (secure, fearful, preoccupied, dismissive) within each of the therapist and non-therapist groups. This was not significant ($\chi^2$ (3, n=41) = 3.27, $p=0.35$, phi=0.28), thus attachment profiles of each group were similar. Results for the attachment categories of each group appear below at table 3.

Table 3. Attachment categories for each participant group.

| | Therapists | | Non-therapists | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Secure | 10 | 50 | 7 | 33 |
| Fearful | 5 | 25 | 3 | 14 |
| Preoccupied | 2 | 10 | 4 | 19 |
| Dismissing | 3 | 15 | 7 | 33 |

Significant differences in the expected direction were seen in both the measures used to assess empathy (see Table 4). First, therapists scored significantly more highly on the Perspective Taking (PT, $t(39) = 2.43$, $p=0.01$), Empathic Concern (EC, $t(39) = 2.09$, $p=0.02$) and Fantasy subscales (FS, $t(39) = 1.74$, $p=0.04$) of the IRI using one-tailed tests. Similarly, therapists scored more highly on both the Cognitive Empathy ($t(39) = 2.42$, $p=0.01$) and the Emotional Reactivity ($t(35.75) = 2.71$, $p<0.01$) subscales of the EQ, as well as total EQ total scores ($t(39) = 2.67$, $p<0.01$).

Table 4. Descriptive Statistics and Independent Sample t-tests for Self-report measures

| Measure | Therapists | | | Non-therapists | | | All Participants | | | t-test |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range | Mean | Standard deviation | Range | |
| ECR | | | | | | | | | | |
| Avoidance | 2.76 | 1.29 | 1.00-5.17 | 2.98 | 1.00 | 1.39-4.56 | 2.87 | 1.14 | 1.0-5.2 | t(39) = -0.623, p=0.54 |
| Anxiety | 3.36 | 1.13 | 1.39-5.82 | 3.12 | 1.07 | 1.83-5.11 | 3.23 | 1.10 | 1.4-5.8 | t(39) = 0.70, p=0.49 |
| IRI | | | | | | | | | | |
| Perspective taking | 21.75 | 3.65 | 14-27 | 18.14 | 5.62 | 5-28 | 19.90 | 5.04 | 5-28 | t(39) = 2.43, p=0.01* |
| Fantasy | 18.75 | 5.51 | 7-27 | 15.81 | 5.29 | 3-23 | 17.24 | 5.54 | 3-27 | t(39) = 1.74, p=0.04* |
| Empathic concern | 21.75 | 4.25 | 14-28 | 18.90 | 4.46 | 10-28 | 20.29 | 4.54 | 10-28 | t(39) = 2.09, p=0.02* |
| Personal distress | 10.20 | 4.64 | 2-20 | 8.62 | 4.52 | 2-21 | 9.39 | 4.59 | 2-21 | t(39) = 1.11, p=0.14 |
| EQ | | | | | | | | | | |
| Total score | 53.80 | 10.42 | 33-70 | 43.71 | 13.47 | 23-69 | 48.63 | 12.98 | 23-70 | t(39) = 2.67, p=0.01** |
| Cognitive empathy | 15.45 | 4.08 | 8-22 | 12.00 | 4.97 | 5-22 | 13.68 | 4.83 | 5-22 | t(39) = 2.42, p=0.01* |
| Emotional reactivity | 15.20 | 3.33 | 7-20 | 11.71 | 4.80 | 5-19 | 13.41 | 4.46 | 5-20 | t(35.75) = 2.71, p=0.01** |
| Social Skill | 8.05 | 2.16 | 4-11 | 6.95 | 3.43 | 2-12 | 7.49 | 2.90 | 2-12 | t(33.98) = 1.23, p=0.11 |

*p<0.05, **p<0.01, one-tailed tests (with the exception of attachment coefficients which are two-tailed)

### *2.3 Mentalizing comprehension and behavioural measures*

No significant differences exist between the groups in terms of socio-perceptual mentalizing (the Eyes Test), the Facial Emotion test overall, or the Perspective Taking task (see Table 5). However, there were trends in the expected direction of therapists scoring more highly in these measures; one tailed independent sample t-tests trended towards significance for total score on the Facial Emotion task ($t(39) = 1.52$, $p=0.07$) and accuracy on the experimental correct answers in the Perspective Taking task ($t(33.53) = 1.41$, $p=0.08$), but overall, no significant relationships were found. A 2x6 between-within subjects ANOVA for the types of emotion in the facial emotion task showed that there was no significant interaction between the groups and emotion understanding ($F(2,38) = 0.25$, $p=.94$). There was a significant main effect of emotion ($F(2,38) = 9.53$, $p=.000$), with angry faces being seen significantly less frequently by both groups. The between groups effect showed a marginal effect one tailed, ($F(1,39) = 2.30$, $p=.07$) corresponding with the total facial emotion score t-test.

### *2.4 Mentalizing production measures*

Significant group differences were seen in some aspects of the ability to produce mental state language (see Table 6). Therapists talked for longer, $t(39) = 1.80$, $p=0.04$. In the number of mental state words and the range of mental state words, no group differences existed although total scores were in the expected direction. A 2x6 between-within subjects ANOVA was run to analyse types of emotion word and modulation. There was no interaction between group and mental state word use ($F(2,38) = .930$, $p=.47$). There was a large main effect for types of words used ($F(2,38) = 55.4$, $p=.000$) with desire and care words being used less than others by both groups. There was also no main effect for type of participant ($F(1,39) = .31$, $p=.58$)

However, in mental state elaboration, i.e. the ability to reflect on cause of mental states in others using causal or descriptive language, a significant group difference was seen with therapists scoring much more highly, $t(39) = 2.07$, $p=0.02$, one-tailed. In addition the LEAS scores which test levels of emotional awareness, higher scores also being reflective of greater emotional elaboration on each of the scenarios, showed a significant difference between groups in the expected direction, with therapists scoring more highly, $t(39) = 1.73$, $p=0.046$, one-tailed. A marginal, although non-significant trend was also seen in the LEAS score for other, in which therapists scored more highly than non-therapists, $t(39) = 1.39$, $p=0.087$, one-tailed.

Table 5. Descriptive Statistics, Independent Sample t-tests for Mentalization comprehension/behavioural measures

| Measure | Therapists | | | Non-therapists | | | All Participants | | | t-test |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range | Mean | Standard deviation | Range | |
| Eyes test | 28.20 | 2.71 | 22-33 | 27.52 | 3.82 | 18-34 | 27.85 | 3.30 | 18-34 | t(39) = 0.65, p=0.26 |
| Facial Emotion Understanding | | | | | | | | | | |
| Total score | 21.70 | 2.43 | 15-24 | 20.62 | 2.13 | 14-24 | 21.15 | 2.32 | 14-24 | t(39) = 1.52, p=0.07 |
| Happy | 4.00 | 0.00 | - | 3.95 | 0.22 | 3-4 | 3.98 | 0.16 | 3-4 | |
| Sad | 3.65 | 0.93 | 0-4 | 3.52 | 0.87 | 1-4 | 3.59 | 0.89 | 0-4 | see text for ANOVA F values |
| Surprised | 3.95 | 0.22 | 3-4 | 3.90 | 0.43 | 2-4 | 3.93 | 0.35 | 2-4 | |
| Angry | 3.05 | 1.00 | 1-4 | 2.62 | 1.20 | 0-4 | 2.83 | 1.12 | 0-4 | |
| Fearful | 3.50 | 0.89 | 1-4 | 3.33 | 0.91 | 1-4 | 3.41 | 0.89 | 1-4 | |
| Disgusted | 3.55 | 0.76 | 2-4 | 3.29 | 1.06 | 0-4 | 3.41 | 0.92 | 0-4 | |
| Perspective Taking task | | | | | | | | | | |
| Controls and fillers | | | | | | | | | | |
| Control reaction times | 3245.28 | 441.68 | 1654.46 | 3281.95 | 391.98 | 1485.21 | 3264.53 | 411.31 | 1661.60 | t(39) = -0.28, p=0.39 |
| Filler reaction times | 2942.66 | 366.22 | 1379.62 | 2953.26 | 355.62 | 1099.95 | 2948.22 | 356.06 | 1379.62 | t(39) = -0.09, p=046 |
| Control accuracy | 14.16 | 1.58 | 10-16 | 14.29 | 1.15 | 11-16 | 14.23 | 1.35 | 10-16 | t(39) = -0.30, p=0.38 |
| Filler accuracy | 92.32 | 5.01 | 75-96 | 93.90 | 2.49 | 88-96 | 93.15 | 3.97 | 75-96 | t(39) = -1.28, p=0.11 |
| Experimental trials | | | | | | | | | | |
| Correct reaction times | 3141.74 | 388.88 | 1433.94 | 3158.81 | 396.97 | 1275.06 | 3150.70 | 388.18 | 1433.94 | t(39) = -0.14, p=0.45 |
| Correct accuracy | 10.95 | 4.03 | 5-16 | 9.33 | 3.07 | 5-15 | 10.10 | 3.61 | 5-16 | t(33.53) = 1.41, p=0.08 |
| Times in ms | | | | | | | | | | |

One tailed tests. Perspective taking task reaction times shows range values rather than minima and maxima for ease of reading.

Table 6. Descriptive Statistics and independent sample t-tests for mentalization production measures

| Measure | Therapists | | | Non-therapists | | | All Participants | | | t-test |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range | Mean | Standard deviation | Range | |
| Mental State language length of recording (mins) | 8.40 | 5.05 | 4-24 | 6.10 | 2.95 | 2-15 | 7.22 | 4.22 | 2-24 | t(39) = 1.80, p=0.04* |
| Mental State Language | | | | | | | | | | |
| Total mental state words | 40.70 | 15.61 | 10-78 | 37.09 | 16.62 | 15-75 | 39.27 | 6.00 | 10-78 | t(39) = 0.55, p=0.29 |
| Cognitive words | 9.40 | 4.66 | 2-23 | 8.71 | 5.02 | 3-22 | 9.05 | 4.80 | 2-23 | |
| Desire words | 1.25 | 1.02 | 0-4 | 1.38 | 1.28 | 0-4 | 1.32 | 1.15 | 0-4 | see text for ANOVA F values |
| Emotion words | 6.60 | 3.39 | 1-13 | 7.14 | 3.93 | 2-14 | 6.88 | 3.64 | 1-14 | |
| Physical emotion words | 8.45 | 3.61 | 3-17 | 6.67 | 3.22 | 2-14 | 7.54 | 3.49 | 2-17 | |
| Care words | 1.45 | 1.10 | 0-4 | 1.10 | 0.94 | 0-3 | 1.27 | 1.03 | 0-4 | |
| Modulations | 13.55 | 9.67 | 0-34 | 12.90 | 8.15 | 3-37 | 13.22 | 8.82 | 0-37 | |
| Mental State language range | 26.60 | 7.43 | 10-45 | 25.52 | 9.01 | 12-43 | 26.05 | 8.19 | 10-45 | t(39) = 0.42, p=0.34 |
| Mental State elaboration | 6.90 | 3.14 | 2-14 | 4.90 | 3.02 | 1-11 | 5.88 | 3.20 | 1-14 | t(39) = 2.07, p=0.02* |
| LEAS | | | | | | | | | | |
| Total | 39.90 | 4.55 | 32-48 | 37.29 | 5.09 | 28-47 | 38.56 | 4.96 | 28-48 | t(39) = 1.73, p=0.05* |
| Score for self | 34.50 | 4.69 | 23-43 | 33.24 | 4.10 | 25-40 | 33.85 | 4.39 | 23-43 | t(39) = 0.92, p=0.18 |
| Score for other | 31.25 | 4.90 | 24-40 | 29.10 | 5.03 | 20-38 | 30.15 | 5.02 | 20-40 | t(39) = 1.39, p=0.09 |

*p<0.05, **p<0.01, one-tailed tests

In summary, whilst there was no clear significant difference between therapists and non-therapists in mental state understanding per se, there were significant differences both in the way therapists self-reported enhanced abilities in perspective taking and empathy, and in the production of enhanced mental state language and talk. These differences existed despite no difference in the attachment profiles of both groups.

### *2.5 Eye-tracking data*

The results for the eye-tracking task have been collated in two ways: (i) including taking into account "zero fixes" ("zeros") within the timings, that is times during the experiment when the participant was momentarily not looking at the screen, and (ii) not taking into account zeros within the fix times. For the purposes of the results section here, results *include* zero fixes (see Table 7), which might be considered to have marginally more ecological validity and takes a potentially more conservative position. In practice, however, there are no material differences between the two sets of results in terms of significance of group differences or significance of correlations with other variables. The full results without taking into account zeros are included at Appendix 22.

In addition, data was collected for the average time to the first fix. However, there were few significant relationships within this data, and in many respects the range and standard deviations seen, particularly in, for example, time to first hand fix, suggested that analysing this aspect of the eye-tracking data may produce spurious conclusions. One of the reasons this data may have been spurious was because it was arbitrary whether the participant would have been looking at the areas of interest by chance during the preceding slide blank and continued this as the slide flipped onto the picture. Thus, time to first fix is not analysed here. A fixation point on the blank slide in future studies may help address this point.

The descriptive data appears in Table 7 below.

Table 7. Descriptive Statistics for Eye-tracking data (all data in seconds, all including zero values)

| Eye-tracking Measure | Therapists | | | Non-therapists | | |
|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range |
| Sum of average fix for faces and hands | 9.39 | 5.34 | 2.40-23.33 | 7.71 | 5.53 | 1.30-21.76 |
| Average fixation faces | 8.13 | 4.76 | 1.83-21.14 | 6.90 | 5.08 | 1.18-20.65 |
| Average fixation hands | 1.26 | 0.71 | 0.12-2.62 | 0.82 | 0.71 | 0.05-3.09 |
| Sum of faces and hands duration of first fix | 0.58 | 0.15 | 0.30-0.83 | 0.49 | 0.17 | 0.21-0.82 |
| Av. duration first face fix | 0.35 | 0.09 | 0.21-0.49 | 0.32 | 0.10 | 0.17-0.52 |
| Av. duration first hand fix | 0.23 | 0.10 | 0.04-0.43 | 0.16 | 0.09 | 0.04-0.32 |

Data was also collected for the sum of the *total* amount of time spent looking at faces and hands together (mean over 7 pictures) as a measure of social orientation. Whilst therapists clearly looked longer than non-therapists, the difference was not significant, $t(39) = 0.98$, $p=0.17$, one-tailed.

Data was also collected for average time spent looking at faces and hands separately. For faces, although therapists did spend longer on average looking at faces, the difference was not found to be significant in an Independent Samples t-test. However, significant difference did exist in the length of time spent looking at hands, with therapists looking longer, ($t(39)=1.96$, $p=0.03$, one-tailed). There was no significance in the difference between the groups in the differences in the length of time looking at faces or hands (i.e. length of time looking at faces less the length of time looking at hands).

Data was analysed for the average duration of the first fix of faces and hands together, the average duration of first fix for faces, and the average duration of first fix for hands. Again, therapists' first face fixes were longer, but not significantly so. However, for the first hand fixation, therapists looked significantly longer ($t(39) = 2.23$, $p=0.016$, one-tailed). The sum of first fix on faces and hands did show a significant difference between therapists and non-therapists: $t(39) = 1.86$, $p=0.035$, one-tailed.

Thus, therapists appear to be orientating towards the pictures for longer in terms of first fixations on aspects of the images that may be used in social cognition or could be considered targets for the gathering of social information. This trend is also seen in total look time, although not significantly in this data.

## 3 The relationships between attachment and mental state understanding in each group

Given research that suggests mental state decoding can be affected by states of mind including depression and anxiety (Lee, Harkness, Sabbagh & Jacobson, 2005), before the correlations for each group were analysed, a partial correlation was undertaken for the full data set to partial out both anxiety coefficients and general social and cognitive ability results in order to show there was no effect of either variable on correlations. The analysis appears at Appendix 23. The large majority of correlational relationships stay the same for these two partial correlations, with one exception, that of Avoidant Attachment and EQ controlling for general social and cognitive ability, which moves from highly significant to marginally significant. Given the general pattern, no further analysis was done on the effect of anxiety or general social and cognitive ability.

Correlation tables for each group appear below at Tables 8 and 9.

### *3.1 Correlation relationships for therapists and differences with non-therapists*

#### *3.1.1 Attachment*

Pearson correlational relationships were seen between certain of the main measures and both avoidant and anxious attachment. As expected, a number of these were represented by correlations between the two coefficients and empathy measures. For therapists, strong negative correlations were seen between EQ and Avoidance (r=-.58, p=.004). This relationship also pertained in the Cognitive Empathy and Emotional Reactivity subscales of the EQ. The EQ and Avoidance correlations were replicated in the non-therapist group although interestingly the coefficients were slightly larger for non-therapists (r=-.61, p<.001).

There were two main significant correlations seen for therapist attachment. First, Avoidance was significantly negatively correlated with scores in the IRI Perspective Taking (PT) subscale (r=-.45, p=.023). A marginally significant negative correlation was also seen between Avoidance and the IRI Empathic Concern (EC) subscale (r=.38, p=.051). Second, Avoidance levels showed a significant negative correlation with Mental State Elaboration scores (r=-.48, p=.016). Neither of these significant relationships was seen in the control group, which evidence coefficients close to zero for both. In addition, no other significant relationships with Avoidant attachment were seen in the control group.

For therapist anxious attachment, significant correlations were again seen in EQ scores (in the reverse direction, r=-.52, p=.01) which was not replicated in the control group with correlations between anxious attachment and EQ at or near zero.

There were no other significant correlations for therapists' anxious attachment although the relationship with the number of correct perspective taking answers approached significance (r=.38, p=0.06). This relationship was not replicated for non-therapists who evidenced a significantly negatively correlated relationship between the number of correct perspective taking answers and attachment anxiety. This therefore represents a difference between the groups. One more notable area of difference was evidenced between the groups in that non-therapists exhibited a significant positive relationship between anxious attachment and LEAS scores, but data for therapists showed no significant relationship between these two variables.

### *3.1.2 Other self-report measures*

The two subscales of the IRI that were of interest for this analysis were the Perspective Taking subscale (PT) and the Empathic Concern subscale (EC). As expected for therapists there was a highly significant positive correlation between the two (r=.49, p=.014), and also between each subscale and the EQ (r=.51, p=.01 and r=.65, p=.002 respectively). This pattern was evidenced also in non-therapists. In therapists there was also a significant relationship between EC and mentalizing production measure LEAS (r=.43, p=.031) which was not seen in the control group.

Other than already discussed, EQ scores for therapists did not correlate significantly with any other measures with the exception of the EQ ER subscale and LEAS (r=.44, p=.027). This in turn was not replicated in the control group, which did, however experience a positive significant correlation between EQ and EQ ER scores and the Eyes test (r=.44, p=.022 and r=.43, p=.026).

### *3.1.3 Comprehension, behavioural and production measures*

For therapists the Eyes test and the Facial Emotion test showed a strongly significant positive correlation (r=.59, p=.003) and while the relationship was not significant in non-therapists trended in the same direction (r=.33, p=.07). Finally, for therapists, the eyes test and mental state elaboration was perhaps surprisingly significantly negatively correlated with mental state elaboration talk (r=-.41, p=.038), though it was in the expected direction for the non-therapists.

Table 8. Correlation relationships between the main measures for Therapists.

| | Self-report measures | | | | | | | ToM understanding | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ECR Avoidance | ECR anxious | IRI Perspective Taking | IRI Empathic concern | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Mental state language | Mental state elaboration | LEAS |
| ECR Avoidance | - | .34 | -.45* | -.38[m] | -.58** | -.48* | -.48* | .21 | -.12 | .16 | -.10 | -.48* | -.10 |
| ECR anxious | | - | -.12 | -.32 | -.52** | -.52** | -.37[m] | -.08 | -.32 | .38[m] | .02 | .21 | -.28 |
| IRI Perspective Taking | | | - | .49* | .51* | .50* | .20 | .02 | .20 | .31 | .26 | .26 | .22 |
| IRI Empathic concern | | | | - | .65** | .63** | .58** | .36[m] | .31 | .04 | -.12 | -.08 | .43* |
| EQ Total | | | | | - | .86** | .75** | -.04 | .21 | -.07 | -.04 | .08 | .38[m] |
| EQ Cognitive Empathy | | | | | | - | .53** | .07 | .34 | .00 | -.06 | -.18 | .16 |
| EQ Emotional Reactivity | | | | | | | - | .29 | .17 | -.20 | -.15 | -.01 | .44* |
| Eyes Test | | | | | | | | - | .59** | .18 | .00 | -.41* | .16 |
| Facial Emotion | | | | | | | | | - | .29 | .09 | -.20 | .13 |
| Perspective correct answers | | | | | | | | | | - | .19 | .26 | .10 |
| Mental State language | | | | | | | | | | | - | .58** | .16 |
| Mental state elaboration | | | | | | | | | | | | - | .29 |
| LEAS | | | | | | | | | | | | | - |

*p<0.05, **p<0.01, one-tailed tests

Table 9. Correlation relationships between the main measures for non-therapists.

| | Self-report measures | | | | | | | ToM understanding | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ECR Avoidance | ECR anxious | IRI Perspective Taking | IRI Empathic concern | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Mental state language | Mental state elaboration | LEAS |
| ECR Avoidance | - | .30 | .00 | -.20 | -.61** | -.59** | -.57** | -.19 | .00 | -.25 | -.31 | -.15 | -.08 |
| ECR anxious | | - | -.35[m] | .26 | -.19 | .00 | -.17 | -.16 | .50* | -.50* | -.29 | -.22 | .49* |
| IRI Perspective Taking | | | - | .61** | .40* | .10 | .39* | .10 | -.20 | .07 | .02 | -.17 | -.24 |
| IRI Empathic concern | | | | - | .50** | .35[m] | .50* | .03 | .04 | -.33 | .01 | -.10 | .20 |
| EQ Total | | | | | - | .82** | .90** | .44* | .14 | -.05 | .33 | .25 | -.04 |
| EQ Cognitive Empathy | | | | | | - | .65** | .28 | .34 | -.04 | .36[m] | .28 | .03 |
| EQ Emotional Reactivity | | | | | | | - | .43* | .09 | -.19 | .29 | .28 | -.13 |
| Eyes Test | | | | | | | | - | .33 | .13 | .07 | .17 | .17 |
| Facial Emotion | | | | | | | | | - | -.06 | -.26 | -.29 | .23 |
| Perspective accuracy | | | | | | | | | | - | -.07 | -.07 | -.15 |
| Mental State language | | | | | | | | | | | - | .77** | .17 |
| Mental state elaboration | | | | | | | | | | | | - | .01 |
| LEAS | | | | | | | | | | | | | - |

*p<0.05, **p<0.01, one-tailed test

### *3.1.4 Eye-tracking data – correlations with attachment coefficients*

Since the primary focus of this study is the analysis of relationships with attachment, the table below shows Pearson correlation coefficients between the attachment measures and the eye-tracking data for the mental state talk task.

Table 10. Pearson correlations between attachment coefficient and eye-tracking measures.

| Pearson's r | Therapists | | Non-therapists | |
|---|---|---|---|---|
| | Avoidant | Anxious | Avoidant | Anxious |
| Sum faces and hands average | -.06 | -.03 | -.29 | -.42* |
| Average fixation faces | -.10 | -.05 | -.26 | -.39* |
| Average fixation hands | .24 | .11 | -.43* | -.48* |
| Sum faces and hands first fix | .15 | .16 | -.55** | -.35 |
| Average duration of first face fix | -.03 | .14 | -.37* | -.30 |
| Average duration of first hand fix | .26 | .22 | -.64** | -.34 |

*p<0.05, **p<0.01, two-tailed tests

The correlation analysis above shows quite a different set of relationships for each of the therapist and control groups. There were no significant relationships for therapists in with either anxiety or avoidant coefficients and two-tailed Pearson's r in most cases, particularly for faces, was low.

The picture for the control group, however, is very different. For average fixation on either face or hands, there are strong negative correlations between fixation length and anxiety, i.e. the higher the anxiety coefficient the less time overall is spent fixating on faces ($r=-.39$, $p=.04$) or hands ($r=-.483$, $p=.01$). The trend is similar for average fixation times and avoidance, although none are significant with the exception of the fixation on hands. In addition for non-therapists, the average durations of first fixes shows a significantly negative relationship between avoidance and duration of first fixes, for both faces ($r=-.372$, $p<.05$) and particularly for hands ($r=-.641$, $p=.001$). The direction of relationship is similar for the anxiety coefficient although none of these are significant.

Tables 11 and 12 below show the Pearson correlation coefficients for the eye-tracking data and other measures used in this study.

Table 11. Eye-tracking Pearson correlation coefficients, with zeros, therapists

| | Self-report measures | | | | | ToM understanding | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | IRI Perspective Taking | IRI Empathic concern | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Mental state language | Mental state elaboration | LEAS |
| Total fixes | | | | | | | | | | | |
| Average fixation faces | .14 | | .03 | .10 | -.01 | -.02 | .17 | .22 | .80** | .43* | .29 |
| Average fixation hands | .08 | -.15 | -.15 | .04 | -.22 | .08 | .22 | .21 | .71** | .05 | .10 |
| Sum faces and hands average | .14 | -.11 | .01 | .09 | -.04 | -.00 | .18 | .22 | .81** | .39* | .28 |
| First fixes | | | | | | | | | | | |
| Average duration first face fix | -.42* | -.17 | -.04 | -.10 | -.03 | -.37[m] | -.12 | -.08 | -.18 | .08 | .28 |
| Average durat. first hand fix | .05 | -.32 | -.19 | .06 | -.35[m] | -.13 | .13 | .38[m] | .47* | .02 | .02 |
| Sum faces and hands first fix | -.23 | -.32 | -.15 | -.02 | -.25 | -.31 | -.01 | .20 | .20 | .06 | .19 |

*p<0.05, **p<0.01, one-tailed tests

Table 12. Eye-tracking Pearson correlation coefficients, with zeros, non-therapists

| | Self-report measures | | | | | ToM understanding | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | IRI Perspective Taking | IRI Empathic concern | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Mental state language | Mental state elaboration | LEAS |
| Total fixes | | | | | | | | | | | |
| Average fixation faces | .01 | -15 | .16 | .13 | .09 | .12 | -.53** | .00 | .55** | .59** | .22 |
| Average fixation hands | .27 | .05 | .45* | .37* | .41* | .30 | -.19 | .34[m] | .57** | .22 | .10 |
| Sum faces and hands average | .04 | -.13 | .21 | .17 | .14 | .15 | -.51** | .05 | .58** | .57** | .21 |
| First Fixes | | | | | | | | | | | |
| Average duration first face fix | .17 | .06 | .39* | .23 | .33 | .02 | -.21 | -.12 | .05 | .15 | -.10 |
| Average durat. first hand fix | .09 | .00 | .57** | .49* | .54** | .27 | .02 | .31 | .24 | .04 | .12 |
| Sum faces and hands first fix | .14 | .03 | .52** | .38* | .47* | .15 | -.11 | .09 | .15 | .10 | .00 |

*p<0.05, **p<0.01, one-tailed tests

*Correlation patterns for therapists and differences with non-therapists*

Patterns of relationships between measures differed between the two groups. In many situations the non-therapist group showed correlational relationships that may have been expected from previous research. For self-report measures, EQ scores and dwell times of first fixes were significantly positively correlated, both in EQ total scores and also Cognitive empathy and Emotional Reactivity. No significant relationships were seen with IRI scales.

For correlations with mental state understanding, no significant relationships were seen with the Eyes test, but negative positive relationships were seen between average total fixation times and Facial Emotion scores, the less time being spent fixating on a picture, the higher the Facial Emotion scores. For ToM production, total dwell time correlated highly significantly with mental state language production and mental state language elaboration, but this was not the case for first fixation durations, which showed no correlation with mental state talk. LEAS scores were not correlated with fixation times.

For therapists the position was very different in both self-report and ToM understanding tasks. There were no significant correlations between fixation durations and IRI or EQ scores, with the exception of one instance: the EQ ER scale correlated positively with the average duration of first hand fix.

For ToM understanding, Eyes tests score was marginally significantly negatively correlated with measures of duration of first fix, i.e. the higher the Eyes score, the less time was spent on first fixes. No commensurate relationship was seen with Facial emotion or the perspective taking task.

For mental state talk, the pattern was similar for therapists and non-therapists; Significant positive correlations were experienced between average total fixation times and mental state language use, and between elaborative talk and total fixation times, although somewhat less strong than the control group. First face fix durations, however, showed no significant relationships with the exception of mental state language use and first hand fix which showed a positive relationship. As with non-therapists, no relationships with LEAS were seen.

As no clear relationships between attachment and behavioural, production or eye-tracking measures of mentalizing were found in either group of participants, it was decided not to explore mediation analysis.

## DISCUSSION

### 1. *Original Aims of the Study*

This study aimed to contribute towards existing knowledge concerning two aspects of therapist relational characteristics, namely attachment orientation and mentalization abilities. Importantly, the main point of interest was the relationship between the two, and how this relationship might differ in comparison to the general population. In summary, it was found that therapists exhibited a greater proclivity to use elaborative mental state language in describing emotional situations and focussed more on social cues in a visual assessment of the same situations. Therapists also demonstrated a self-reported higher level of affective and cognitive empathic ability than non-therapists. Therapist attachment styles had limited and very specific effects on mentalising behaviours. These findings are considered particularly relevant at a time when the psychotherapeutic world has become highly focussed on the nature of the relationship between client and therapist, and on what attributes of the therapist might contribute towards the quality of this therapeutic relationship.

Whilst it is already acknowledged in the psychotherapeutic literature that both therapist attachment and ability to mentalize are highly relevant therapist characteristics (e.g. Slade, 2000, Rizq & Target, 2010a), there has been only a small amount of existing research that has considered the mentalizing abilities of therapists (e.g. Hassenstab et al., 2007; Hall et al., 2000) and an equally modest amount which has explored the therapist attachment style (e.g. Dozier et al., 1994). No study to date has explicitly contemplated how attachment might directly affect therapists' mentalizing abilities (which clearly has consequences for the therapeutic relationship). This study therefore aimed to evaluate this fully by comparing the relationship between mentalizing and attachment in therapists with that exhibited in a well-matched non-therapist control group. Given that therapists are highly experienced in mentalizing, and may well have addressed their personal attachment related experiences more fully due to the requirements of training, personal therapy and clinical practice, the expectation underlying this study was that therapists may exhibit different characteristics in the relationship between attachment orientation and mentalizing in comparison with the general population.

### 2. *Differences between therapists and non-therapists*

#### 2.1. *Attachment*

Given that the limited research in attachment in therapists (e.g. Leiper & Casares, 2000) has not indicated marked differences in attachment orientation, it was not expected that levels

of attachment would differ between the two groups. This was borne out and there was no significant difference in attachment orientations as measured by the difference in mean levels of anxiety and avoidance. Furthermore, though the focus of the main analysis was not on attachment categories, interestingly 50% of the therapist group were categorised as secure (similar to that found by Rizq & Target, 2010a).

2.2. *Self-reported abilities in mentalizing(empathy)*

As may have been expected, given previous research on self-reported abilities in empathy (e.g. Hall at el., 2000) the therapist group self-reported significantly greater abilities in empathic ability than the non-therapist group. First, for the IRI measure, therapists scored more highly in the Perspective Taking (PT), Empathic Concern (EC) and Fantasy (FS) subscales. The PT subscale attempts to measure the tendency to adopt the psychological views of others, and the EC subscale to assess feelings oriented towards the other of sympathy and concern (Davis, 1983). Higher scores in both subscales appear to reflect enhanced abilities in both cognitive and emotional empathy which might be expected from the therapists given the obvious professional requirements for such abilities and the knowledge that clients rate therapists more highly if they display empathic responses and appear to understand their experiences (e.g. Greenberg et al., 2001). However, unlike in Hall et al.'s (2000) slightly larger sample of practitioner psychologists or Hassenstab et al.'s (2007) comparable sample of psychotherapists, there was no evidence of therapists scoring lower on the PD subscale of the IRI suggesting that in this group and in these experimental conditions at least, there is no evidence of greater moderation or regulation of distress within the therapist group compared to controls.

According to Baron-Cohen and Wheelwright (2004), the IRI represented the best measure of empathy developed to date, because three of the four factors are directly relevant to accepted concepts of empathy. However, the IRI may measure concepts broader than empathy in the FS subscale or the PD subscale which may assess imagination or emotional self-control, and although these factors may be correlated with empathy, it arguable that they represent something broader than empathy itself. The above findings on the IRI have therefore been extended using another measure of empathy, the EQ, to focus purely on the cognitive and affective aspects of empathy. Therapists also reported significantly higher scores on the EQ, particularly in the Cognitive Empathy (CE) and Emotional Reactivity (ER) subscales. According to Lawrence et al. (2004), Cognitive Empathy (CE) measures the cognitive appreciation of affective states in others, whilst Emotional Reactivity (ER) reflects the tendency to experience

an affective reaction in response to others' mental states. This finding is consistent with previous research suggesting that the strongest relationships between the IRI and total EQ scores are with the PT and EC scales of the IRI (Lawrence et al., 2004). The higher scores in the CE and EC components of the EQ therefore reinforce that this group of therapists self-report enhanced abilities in both cognitive and affective components of empathy when compared with controls. This data taken together therefore replicates and extends previous research suggesting that therapists consider themselves good empathisers and capable of taking another's perspective.

### *2.3. Mental state comprehension and behavioural measures*

In contrast to the self-report measures, there were no differences between the two groups on measures of behavioural understanding of mentalization measured either for emotion understanding i.e. facial emotion task (where therapists did score more highly but not significantly so), or the social-perceptual measure of mental state understanding (Eyes task). This replicates Hassenstab et al. (2007) who found that a group of 19 therapists scored no differently to a same-size control group when looking at emotional faces or on the Eyes task. The inference from these results is that therapists do not necessarily possess an enhanced ability to mentalize as defined by mental state understanding and as measured by behavioural abilities in recognising facial displays of emotion. This holds despite the fact that the therapists concerned represent a relatively well-qualified and experienced group of practitioners with a significant number of client hours between them.

An additional behavioural measure of mentalizing ability, unused in previous studies, was the perspective taking task (Keysar et al., 2000), which measures the socio-cognitive aspect of mental state understanding. Here, although there was a trend towards therapists scoring more highly (and slightly faster) than non-therapists in the ability to accurately and spontaneously take another's perspective, the difference was not significant. Thus, it cannot be claimed in this participant group that therapists possess significantly enhanced capabilities in perspective taking. This is perhaps surprising given Wu and Keysar's (2007) finding that those who have experienced a cultural pattern of focussing on the other tend to do better on these tasks, arguably because they possess a greater proclivity to use their mental state understanding abilities. It may have been expected that experienced therapists may have shown a similar tendency, but although it seems that they exhibit a greater degree of accuracy in this sample, the difference was not significant. This finding therefore extends the finding of no difference between behavioural measures of mentalizing between therapists and non-therapists but with using a novel measure of social-cognitive perspective taking.

*2.4. The "production" of mentalization*

While much research on mentalizing has focussed on self-report or behavioural measures, an alternative concept of mentalization utilised in this study was the "production" of mental state language, used as a measure of the proclivity to use mentalization abilities (Ruffman, et al., 2002; Meins et al., 2006). In the task involving the description of everyday social pictures, whilst therapists used a greater range and number of mental state words and modulating language in their narrative, the two groups did not differ in this respect significantly. Notwithstanding this, there was a significant difference in one area of mental state language production, that of mental state elaborative language, with therapists scoring significantly more highly. Examples of the elaborative talk used more frequently by therapists included causal or explanatory talk about emotion e.g. "she felt frightened *about* being on the bridge" or "they're both amused *that* the boy is throwing water", as well as examples of contrastive talk to explain differences in emotion, e.g. "Looks sad *but* not making much of a noise". Thus it appears that therapists are more inclined to attach meaning, cause, or explanation to mental states in others. This is an important finding because the use of elaborative talk is seen by some as a more accurate measure of spontaneous production of mental state understanding than the use of simple mental state terms (e.g. Ontai & Thompson, 2002; Ontai & Thompson, 2008; Ontai & Virmani, 2010; Slaughter et al., 2007).

A mother's use of an open and elaborative discourse about mental states is intricately linked to security of attachment in the child (Bretherton, 1990b; Ontai & Thompson, 2008), and in adulthood, research demonstrates that adults who are able to reflect and metalize about themselves are more likely to be secure (Fonagy et al., 1995). It is worth speculating therefore that it is possible that not only are therapists displaying a more secure attachment profile in their use of elaborative mentalizing language, they may also be more capable of facilitating increased mentalization in their therapeutic work with clients, with possible implications for changes in client attachment organisation. Nonetheless, the finding of increased proclivity to use mentalizing skills in therapists is novel and worth exploring more in future research.

The second measure of mental state production used was the LEAS (Lane et al. 1990), an instrument which concentrates entirely on the identification and differentiation of affect and disregards almost completely any cognitive states. It is centred on the interaction of the self and other and requires participants to imagine themselves in the scenarios, unlike the Everyday Pictures exercise which is focussed primarily on a third party situation. It is therefore subtly different in terms of which aspects of mental state production it measures, although it does not measure anything more complex than the use of simple affective words. Although there was a strong trend seen towards therapists using more emotion words, the difference

was not significant. Given the similar result in the simple use of mental state terms in the Everyday Picture exercise, this result for the LEAS is perhaps not surprising, and because the more intricate concepts of elaboration or explanation are not assessed in the LEAS, no replication of the enhanced elaborative talk scores for therapists was possible.

In terms of the production of mentalization, therefore, the above results suggest that in the use of simple mental state terms, talk of cognitions, desires and emotions, therapists and non-therapists do not differ significantly. However, in the more complex and perhaps more deeply processed areas of elaborative mental state language, therapists score more highly. Therapists therefore appear to be processing emotional input more thoroughly in order perhaps to understand emotionally related experience more fully. It is also suggested that this result evidences that therapists may be exhibiting a greater proclivity or ability to use their mentalizing abilities in the use of elaborative mental state language. Given the suggested links between the use of mental state language including elaborative language and security of attachment, it was interesting in particular to evaluate this relationship quantitatively and to establish what if any differences existed between the therapists and non-therapists in this respect. This is discussed below in section 3.3.

## *2.5. Eye tracking and social orientation findings*

### *2.5.1.Total dwell times*

The between groups eye-tracking data yielded some interesting results. There was a marginally significant difference in the overall amount of time that participants looked at the photos, with therapists looking longer. Within this, therapists showed a tendency to look longer at both faces and hands, i.e. social information (although this seemed to be driven by hand fixations). This may suggest that therapists are attempting to process all social information as much as possible, instead of concentrating solely on the facial region of individuals. This may simply be a result of training, during which therapists are encouraged to assess body language and other social information as well as the spoken word (e.g. Parrott, 2006). However, in line with Klin's view on social orientation as a measure of mentalizing (Klin, 1991, 2000), it may represent something deeper and relate to a more subtle social cognition manifest through the processing of complex social cues and orientation towards social stimuli. This important finding suggests that this social-stimuli foundation skill of social cognition development (Fletcher Watson et al., 2008) appears to be more developed in therapists than the general population.

### *2.5.2.First fix durations*

Consistent with total dwell times, therapists showed significantly longer first fixes for faces and hands together, and for first fixes on hands only. Although the trend was also towards significance in faces only, the results were not significant. However, the indication again is that therapists are immediately attempting to use all possible information available to them in their assessment of another's' mental state; more so than non-therapists. This finding expands on work by Fletcher-Watson, et al. (2009) who noted a particular disadvantage in *first fixation* (as distinct from total dwell time) data in autistic individuals and who concluded that this may represent a highly significant, although relatively subtle, measure of "real-time" mentalization, the effects of which could be profound in day-to-day social interactions. In that respect therefore, again, the therapist group appears to demonstrate an enhanced ability to orientate towards social information in emotional interactions, in other words, to mentalize. This, again, is a novel finding in this study.

## *2.6. Summary of differences between therapists and non-therapists*

In summary, therefore, therapists appear to exhibit a greater tendency to process more thoroughly certain aspects of social and emotional information. This is evidenced by a greater proclivity to use elaborative mental state language in describing emotional situations and by a greater focus on social cues in a visual assessment of the same situations. Therapists also demonstrate a self-reported higher level of affective and cognitive empathic ability than non-therapists. However, in behavioural terms, although there are trends in the expected direction, therapists do not evidence a significantly enhanced ability in Theory of Mind tasks, emotion understanding, or visual perspective taking tasks. Thus, although therapists may be better at using their mentalizing abilities in terms of a greater breadth and depth of processing, there is no evidence that they possess greater mental state understanding abilities per se.

This is an interesting finding in its own right. It suggests that whilst there may be trends to explore in future research with larger samples, in this particular study the possession of mentalizing skills is at similar levels for both therapists and non-therapists. Therapists are, however, significantly better at using those skills. This may explain why therapists think they possess enhanced levels of empathic ability: in practice, better "production" of mentalizing abilities may well be experienced by the self and others as a more developed ability to empathise and take another's perspective.

The discovery that therapists are generally better at some aspects of mentalizing but not others was only made possible in this study because of the breadth of known mentalizing

measures used. Data from the more traditional adult tests of mentalizing abilities such as the Eyes test (Baron-Cohen et al., 2001) yielded no significant differences, but data from the more novel, and arguably more subtle, measures such as eye-tracking in social/non-social stimuli tasks (Fletcher Watson et al., 2009) or the mental state language task (Ruffman et al., 2002; Slaughter et al., 2007) were able to distinguish group differences between therapists and the control group.

*3. The relationship between mentalizing and attachment*

The study delivered a somewhat complex set of relationships between attachment and mentalizing abilities, which were in some cases subtly and in other cases appreciably different between the two groups.

*3.1. Attachment and self-reported empathic abilities*

Although therapists generally reported enhanced empathic skills, the relationship with attachment was complex. In simple terms, the more avoidantly attached a therapist self-reports themselves, the lower their self-report empathic abilities on both the EQ and the IRI scales (both cognitive and affective subscales). This relationship is similar for non-therapists when measured with the EQ and appears stronger in effect indicating perhaps that attachment avoidance has less of an influence on mentalization in therapists than in non-therapists. An explanation of this may arguably indicate an ability amongst therapists to either consciously or unconsciously "dampen" the deactivation effect of an underlying avoidant attachment when processing emotional information requiring an empathic response (Crittenden 1997, Mikulincer & Shaver, 2003). Conversely anxious attachment styles in therapists are also associated with lower empathy scores on the EQ, although not on the IRI, and this contrasts with no anxious attachment/empathy relationship in non-therapists as measured by either scale. For whatever reason, therefore, anxiously attached therapists (but not non-therapists) report a less developed empathic ability.

In sum, both avoidantly and anxiously attached therapists self-report significantly reduced levels of empathy, which might be expected from previous research predicting a better therapeutic bond and a more responsive therapist style if therapists evidence more secure attachment behaviours (e.g. Black et al., 2005; Dozier et al., 1994; Dunkle & Friedlander, 1996; Rubino et al., 2000).

3.2. *Attachment and mental state comprehension behavioural measures*

Somewhat surprisingly there were no significant relationships between either avoidance or anxiety and mental state understanding measures (i.e. the Eyes test, facial emotion task, or

perspective taking task) in therapists. A marginally positive relationship existed between therapist attachment anxiety scores and the ability to accurately take another's perspective, but it was not significant. Thus, therapist attachment styles do not appear to be meaningfully influencing mentalizing as evidenced by any of the more traditional behavioural measures of mental state understanding.

The main point of difference between the groups in these measures lies in two areas. First, non-therapists exhibited a significantly positive relationship between attachment anxiety and the ability to identify facial emotion, the more anxiously attached the individual the greater the ability to identify facial emotion. Thus, the control group evidences behaviour that may not be expected from previous literature which suggests that the greater the attachment anxiety, the less accurate individuals are in identifying emotional cues, despite a general heightened vigilance (e.g. Fraley et al., 2006). Notwithstanding this specific effect of attachment anxiety in the control group, however, a similar effect was not observed in therapists, suggesting that despite some therapists recording relatively high attachment anxiety, any effect of this on mentalizing, either positive or negative, as measured by facial emotion understanding is somehow negated.

The second main between-group difference again concerned attachment anxiety. Unlike therapists, non-therapist attachment anxiety is significantly negatively related to the number of accurate perspective taking answers, i.e. the more anxiously attached they are, the less able they seem to be able to take another's perspective. Fraley and Shaver's (2000) suggestion that attachment-related cognitive processes play a significant role in the monitoring of the environment for cues may be relevant here. The net reaction times of non-therapists show a negative relationship with anxiety, such that the more anxiously attached an individual is, the faster their reaction times in making judgements. It seems that anxiously attached non-therapists therefore may have slightly rushed their decision making at the expense of accuracy. This would correspond with Fraley et al.'s (2006) finding that anxiously attached participants judged the onset and offset of stimuli more quickly than less anxious individuals reflecting a vigilance in processing social cues at a basic perceptual level. Again, no such effect of attachment anxiety is seen in therapists.

In summary, neither of the attachment related relationships evidenced by the control group, nor any other significant attachment relationships with behavioural mental state understanding tasks were seen in the therapist group. Given the previous literature pointing towards the potential influence of attachment on emotion processing (e.g. Dewitte, 2011; Fraley et al., 2006; Niedenthal, et al., 2002), these results were somewhat surprising, particularly in the context of some highly significant results in the control group. Again, a

potential explanation of this may centre on the ability of therapists to somehow suppress or overcome their attachment related mentalizing behaviours (Crittenden 1997, Mikulincer & Shaver, 2003), allowing them to respond more objectively to the information they are receiving. This could either be through some learned mechanism related to experience or training, or due to some aspect of earned security status (Pearson et al., 1994). Given the lack of detailed knowledge concerning the pathways to earned security and its relatively recent emergence as a mainstream concept for exploration (Hesse, 2008), it is outside the scope of this study to propose a detailed explanation of the processes by which therapists may be able to experience relatively secure attachment behaviours whilst their underlying attachment organisations remain insecure. Nonetheless, the finding that therapists seem to experience the effect of attachment on some aspects of mentalization less acutely than control group members is interesting and requires further exploration.

### *3.3. Attachment and the "production" of mentalization.*

With respect to the "production" of mentalization, patterns for the relationship between attachment and mentalization as measured by the use of mental state language differed between the groups. In the Everyday Pictures task, there was just one significant relationship in the therapist group, a negative association between attachment avoidance and the use of mental state elaborative talk, i.e. avoidant therapists were far less likely to use causal, or explanatory language when describing everyday social scenes. This relationship with avoidance was not the case for any of the other measures of mental state word use on this task. Furthermore, there were no significant relationships between mental state language and anxiety coefficients in the therapist group. There is therefore something about elaborative talk that is compromised in therapists with higher attachment avoidance that is not mirrored in the same therapists when using simple mental state or emotional words.

This study suggests that this may be related in some way to a difference in processing associated with the production of mental state language. Two tentative explanations can be offered. First, although avoidant therapists can overcome their attachment styles in using an appropriate amount of simple mental state language when describing emotional scenes, they are not able to overcome automatically the effects of an avoidant attachment style in processing more detailed elaborative and causal inferences about emotional stimuli, possibly because such causal talk requires a deeper level of cognitive processing which is more likely to evoke attachment related behaviours than more simple language. Alternatively, or possibly in combination, elaborative or clarifying talk can be seen as a more sensitive measure of the "proclivity to use" ones mentalization abilities, requiring a greater cognitive effort. It seems possible that avoidant therapists may find it more difficult to utilise their mentalizing

capabilities to elaborate more than at a possibly superficial level in terms of the description of emotion stimuli.

This effect of avoidance on elaborative talk was not evidenced in the non-therapist group but it is difficult to draw conclusions about this or make a comparison with the therapist group partly because the levels of elaborative talk used by non-therapists were relatively low. The non-therapist group also displayed a strong positive correlation between anxiety and LEAS scores, which was not mirrored by therapists. Thus, whilst anxiously attached control group members may be hyperactivating (Mikulincer& Shaver, 2007) and therefore dwelling extensively on the affective experiences elucidated in the LEAS scenarios, anxiously attached therapists are again evidencing a relatively controlled response to these scenarios, in a similar manner perhaps to that suggested above for mental state understanding measures.

*3.4. Attachment and social orientation eye-tracking data*

In this area of social orientation as a measure of mentalizing, there were marked differences between the therapist group and the control group. Therapists displayed no influence of attachment orientation on fixation times on the social stimuli contained therein. They also displayed no attachment influence on times of first fixes on social information. The only association evidenced was that of a negative relationship between levels of attachment avoidance and duration of first fix anywhere on the picture. This association may be expected from hyperactivation/deactivation attachment theories (e.g. Mikulincer & Shaver, 2003, 2007a), but with the exception of this finding (which does not distinguish social versus non-social stimuli), there is a stark lack of association between therapists' attachment orientations and either total or first fix looking times at social information.

The position with respect to the non-therapists was entirely different, however. In this group, the more avoidantly attached the individuals were, the lower the time spent on first fixes of social stimuli. Such an association might be expected from previous first fix looking-time research (e.g. Fletcher-Watson, 2009) and was highly significant. This eye-tracking result therefore is consistent with and represents a novel extension to Fletcher Watson et al.'s work. Similarly, the more anxious the individual in the control group, the lower the overall total time spent on the stimuli. The striking finding here is that whilst non-therapists were behaving in a manner which may be expected from previous research related to social orientation and mentalizing, therapists showed no attachment related relationships in respect of social stimuli looking at all.

*4. Summary of findings*

Therapists demonstrated an enhanced performance, compared to control group participants, in several aspects of mentalizing as measured by the battery of tasks. First, this was seen in the use of more complex mental state language thus arguably exhibiting an increased proclivity (or ability) to use their mentalization skills. Second, therapists showed a greater orientation towards social stimuli as evidenced by eye-tracking technology, evidencing an underlying advantage in this fundamental aspect of social cognition. Third, as expected they self-report a greater degree of empathic ability. Their performance in the perspective taking task also trended towards a significant association but ultimately fell short of a statistical difference with controls. They did not, however, evidence enhanced capabilities in some of the more traditional behavioural mental state understanding measures such as facial emotion recognition. This suggests that, as assumed in the design of the study, the significant number of mentalizing tasks employed measure subtly different aspects of mentalizing capabilities.

The influence of attachment orientation on the mentalizing skills of both the therapist and the non-therapist group was complex and the differences in this relationship between the two groups provide some interesting results. The results highlight the benefit of having recruited a well-matched control group of sufficient size and being able to compare non-therapists' and therapists' behaviours. In summary, overall therefore non-therapists tend to behave more according to the expectations of previous attachment related research (e.g. Dewitte, 2011; Fraley et al., 2006; Niedenthal, et al., 2002) than do therapists. For example, attachment anxiety in non-therapists appeared to lead participants to be poorer at taking someone's perspective in terms of accuracy but to be more likely to focus on (be preoccupied with) and use mental state words when describing every day social scenes. With respect to avoidant attachment, its effect can be seen in the eye tracking experiment, in which levels of avoidant attachment in non-therapists correlated with a significant reduction in the first fix looking time at social information, a novel eye-tracking finding in itself. All these findings suggest that on the whole the control group participants evidence the relationships between attachment style and mentalizing abilities that may either have been expected or inferred. These findings replicate previous work outlined above but also extend it by using novels tasks such as a perspective taking experiment and eye-tracking technology.

It is striking however that, with the exception of two significant associations between therapists' attachment style and mentalization behaviours, no other significant influences of attachment on therapist mentalization appear to exist.

It is argued here that the apparent reduced impact of attachment as an influence on mentalizing in therapists may be a result of several particular issues affecting this group of individuals. Therapists have usually undertaken significant levels of personal therapy, and have substantial

experience in reflecting on their own and others mental states. Internal working models of attachment are fluid structures that should be sensitive to changes in social and attachment related environments and change over a period in response to the accumulation of experience (e.g. Lewis, Feiring & Rosenthal, 2000). Similarly, it is highly plausible that therapists may have experienced a shift from an insecure attachment towards an "earned secure" orientation (Pearson et al., 1994) over a period of time. Thus, it is probable that some form of alteration of therapists' attachment organisation in many of the participants may have taken place. Research does not yet inform us sufficiently about some of the mechanisms of change, for example, whether some behaviours might change and some might remain, even if attachment style per se has changed, or whether behaviours have a conscious and an un-conscious element to them. What seems evident in this data, however, is that therapists reporting insecure attachment behave as though they are more secure.

Furthermore, therapist training actively encourages the suppression of inappropriate attachment related behaviours in the therapeutic relationship, so reflective therapists will be highly experienced in identifying but consciously down playing their attachment related responses when attachment systems are activated. It is possible, given the amount of emotional information contained in many of the tasks, that therapists relied on a habitual way of being, and produced responses to the stimuli not according to their underlying attachment orientation, but concurrent with a professional persona. This is particularly possible given that the participants may have been primed to behave as they would when in client therapy, i.e. they knew they were there because of their profession and were participating in the study as a therapist.

Finally, the extensive battery of mentalizing tasks employed allows us to make some observations about the particular aspects of mentalization abilities that were the exceptions to the general picture of limited attachment influence. As has been noted, mental state understanding measures did not typically yield significant evidences of the effect of therapist attachment on mentalizing. The one area that suggested a significant influence of attachment was in mental state language elaboration (measuring the production of or proclivity to use mentalizing ability). This represents a particularly subtle measure of mentalizing. The results suggest that it is in the area of "proclivity to use" mental state understanding abilities that avoidant therapists in particular find difficult. This association between less proclivity to use mentalizing skill and avoidance may be a very subtle difficulty that more avoidant therapists are unaware of, possibly because of their success in overcoming the effects of their avoidance in more mainstream mental state tasks, but nonetheless, one that could have significant impact for their role in facilitating mentalization during therapy for their client, and thereby being able to act as a secure base.

5. *Clinical implications of this research*

There are clear clinical implications of these findings for therapists both in practice and in training. For therapists in practice, on the one hand, the data suggests that the extensive training associated with becoming a therapist, including self-reflection, generally fosters an ability to overcome one's attachment related biases sufficiently such that any response to emotional or attachment related information is appropriate for the client in the context of therapy. This is clearly a good thing, as one of the basic tenets of good therapeutic practice is the ability to manage one's own emotional reactions to clients (Slade, 2008). However, if the therapists' attachment style is avoidant, he or she should be aware that there are elements of avoidant attachment behaviours which are not so easily lost, for example a difficulty with elaborative talk, and that may pertain even if at a surface level, those behaviours are identified and dealt with. For training programmes, this data suggests that therapist trainees would do well to consider in some detail their individual attachment styles and reflect on how they may hold the potential to influence their clinical practice, particularly if the therapist tends towards an avoidant attachment style.

A second implication of therapists' apparent generally enhanced ability to produce causal, explanatory and clarifying talk about emotional scenes concerns the need for therapists to use this skill appropriately. Provocatively expressing feelings relating to what the client presents in sessions is not often the appropriate use of the therapists' emotional response, neither would it serve the therapist well to be internally rehearsing causes and explanations for client material at the expense of listening to the spoken word. Again, trainees might want to consider when they express their emotional response to clients and when they do not.

As far as the author is aware, there is no requirement in professional training programmes to undertake a self-analysis with specific respect to attachment patterns, or for that matter to undertake any sort of exploration of aptitude to train as a therapist. Whilst not wishing to suggest that quantitative analysis can or should differentiate which candidates may make good or bad therapists, there may well be some merit in advising therapist trainees to work on these aspects of themselves through self-reflection. An obvious way of doing this is by means of personal therapy which Farrell (1996) has highlighted as an excellent way to reduce hindrances to therapeutic work resulting from personal blind spots, and which Rizq and Target (2008b) see as a vehicle to aid the establishing of real relationships with clients and emotional robustness in practice. The mandatory requirement for the amount of personal therapy that trainee therapists must undertake is relatively easily satisfied, for example the BPS requires trainee Counselling Psychologists to undertake 40 hours. It is suggested that training programmes would do well to consider directing trainees to explore attachment as a specific subject within their personal therapeutic journey.

## 6. Limitations and Improvements

### 6.1. Measures

#### 6.1.1.Attachment

One of the major issues facing any study concerned with attachment is the appropriate measurement of attachment. In this study the ECR was chosen as the appropriate measure for a number of reasons. It focuses on the two dimensions that appear to be universally supported as the most appropriate components of attachment (Crittenden, 1997; Fraley & Waller, 1998; Mikulincer et al., 2003) rather than grouping individuals into broad classifications, is targeted at measuring adult attachment in close relationships (i.e. appropriate for assessing attachment related behaviours of adults in a close one to one interaction), and is designed to measure dispositional or trait-like patterns rather than idiosyncratic temporary states that might be partner or circumstance specific. In comparison with alternative self-report measures it appears to be well-supported in the literature in terms of measurement precision, reliability and construct validity (Fraley et al., 2000). It was chosen in preference to the alternative AAI in this study for these reasons and because of its practical advantages in terms of ease of administration to large participant groups, the straightforward but versatile nature of the data produced (i.e. dimension led rather than categorical) and the study's budgetary constraints relating to time and money.

However, it is acknowledged that the ECR is not itself a perfect measurement of attachment for the purposes of this study. Ideally, a second measure of attachment could have been included to corroborate the ECR data. In addition, administering the ECR as a one-off measurement of an individual's attachment orientation does not address fully the debate in the literature concerning the stability of underlying attachment patterns over time. Fraley et al. (2000) have identified that those high in trait characteristics will tend to response consistently over time, but those lower will be less reliable due to the probability in endorsing any one particular item. Thus, in an ideal world, a study on attachment orientations would provide a longitudinal measure of attachment across a certain period in order to assess and be more confident in the attachment data used. Such data would allow a more informed assessment of how attachment orientation might be related to evidence of mentalization capabilities. It might also allow an assessment of whether therapists' attachment styles change with experience in counselling, and whether their ability to mentalize changes over the same period as well.

In addition on the subject of stability of attachment representations over time, as highlighted again recently by Fraley, Vicary, Brumbaugh & Roisman (2011), although there is a stable factor in attachment working models, there may be significant temporary variations in attachment style. Researchers do not really know whether prototype-like models (a prototype of attachment is developed early in childhood which influences dynamics significantly throughout the life course) or revisionist models (assuming working models are far less inherently stable) better explain patterns of stability or change in adult attachment. This represents a significant gap in the understanding of attachment processes, despite attempts to undertake longitudinal studies in attachment stability (e.g. Fraley, 2002). In the case of the above suggestion that therapists might be tested for their attachment orientation at either end of a length of time, the pattern of retest correlations tells us only about attachment orientation at those two specific times and not about variations in between or about the underlying stability of attachment style. Furthermore, Fraley et al. (2011) found a differential stability of attachment according to whether the close relationship being measured was romantic (less stable) or parental (more stable). This suggests that future research would do well to consider the development of measures associated with specific close relationships. The relevance of this debate for this study lies in the question of whether therapists attachment behaviours for example with their clients are influenced by a different set of contextual influences than those in their general attachment relationships, and by definition therefore result in a different way of being in close relationships in the therapeutic setting.

### *6.1.2.Valence*

This study has not attempted to analyse the effects of attachment on mentalizing with reference to the valence of stimuli. For example, the Everyday Pictures task might be extended to incorporate photographs specifically exhibiting for instance anger, sadness, joy, and an analysis undertaken to assess whether attachment styles might influence which emotions or mental states are being identified and talked about, and which are not, whether these differ between the groups, and whether there is a relationship with anxiety or avoidant attachment coefficients. This may offer data consistent with the view that anxiously attached individuals will have greater emotional response specifically to negative stimuli due to increased hyperactivity of the attachment system, or that avoidant individuals experience a dampening down of the attachment system activity in similar circumstances and, for example, defensively exclude negative emotions from conversation (e.g. Bretherton, 1990b, 1991; Bretherton & Munholland, 1999; Zilber, Goldstein & Mikulincer, 2007).

### 6.1.3.*Ecological validity of stimuli*

It is mentioned above that the literature concerning orientation to social stimuli, specifically in the context of autism research, is beginning to focus on the ecological validity of the stimuli presented to participants in eye-tracking studies and other social cognition tests (reviewed in Boraston & Blakemore, 2007). For example, the choice of social situation stimuli can include still photographs, cartoon drawings, moving video images, interactive vignettes and many more. One recent study developed a sensitive video-based test for the evaluation of subtle mindreading difficulties: the Movie for the Assessment of Social Cognition (MASC; Dziobek, Fleck, Kalbe, Rogers, Hassenstab, Brand et al., 2006), which involves watching a short film and answering questions referring to the actors' mental states. It has been used in one study relevant to therapists' mental state understanding (Hassenstab et al., 2007). In this study, due to the constraints of practicality, and to the fact that the eye-tracking task doubled as the mental state language task (and therefore required participants to have an unlimited time to narrate their responses to one shot photographs), still photographs were used. Whilst this arguably has less ecological validity that a moving image, the photographs were carefully chosen to ensure that they contained sufficient emotional and attachment content to remain as valid stimuli. However, future research concerned with similar questions might explore the possibility that eye-tracking related to social versus non-social stimuli could be measured using moving images as in the MASC (Dziobek et al., 2006), or even videos of counselling sessions.

### *6.1.4.Mental state talk measures*

Given the ultimate importance of mental state talk in this study in terms of the findings relating to elaboration, additional research should consider aspects of this that have not been able to be included here. For example, researchers have pointed to the importance of connectedness, appropriateness and non-attuned comments in mental state talk. Connectedness, defined as a conversational alignment based around semantically related utterances, has been found to be a strong predictor of mentalizing performance, the strength of the prediction being strongest for mental state references *within* connected turns (Ensor & Hughes 2008). Also, appropriateness in mental state talk has been seen as hugely important to the construct of maternal responsiveness (Laranjo et al., 2008; Meins, Fernyhough, de Rosnay, Arnott, Leekam, & Turner, 2011) and includes observations such as the independent coder agreeing with the mother's reading of her infant's internal state,

or that the mother voiced (using the first person) what the infant might say if he/she could speak. Most recently Meins et al. (2011) have also explored the influence of inappropriate (recently referred to as non-attuned) mental state comments including the misinterpretation of mental states or the intentions of the other, and observed lower scores for non-attuned mind-related comments distinguished mothers of secure infants from mothers of insecure infants. Connectedness, appropriateness, and conversely non-attuned comments seem particularly important for therapists in clinical practice and to the therapeutic relationship as a whole and present an area of more detailed investigation concerning attachment and mental state talk.

### 6.1.5. *Other measures*

The battery of tasks presented to the participants took on average approximately 90 minutes to complete and this was considered at the top end of what was appropriate both from the standpoint of the amount of time being given up by the participant and in terms of the concentration levels needed to complete the tasks adequately. However, there are several measures that would have been chosen to be included if it were possible to spend unlimited time testing participants. These would include measures to control for the effect of executive function and language abilities.

However, the most interesting additional measure would clearly be an assessment of therapeutic outcome. This study is predicated on the assumption that enhanced mentalization skills contribute to (mediate) the therapeutic outcome, and that therapist attachment is important in its own right as an influence on the therapeutic relationship but particularly in terms of its influence on therapist mentalizing ability. If it were possible to undertake the study as a longitudinal analysis, with an assessment of therapeutic outcome (and perhaps satisfaction with the therapeutic relationship as reported by clients), it would shed significant light on some of the issues raised here. These additional elements of research were beyond the scope of a PsychD thesis because of timing constraints.

## 6.2. *Experimental Design*

This study was subject to a finite time period for completion. As such, whilst the largest sample group possible was desirable, there were also practical constraints on the recruitment of a significant number of practising therapists and control group participants. Thus, a decision

was taken to include a minimum of 20 in each group to ensure statistical relevance, but also to complete the project within the required timescale. Repetition or extension of this research should involve a larger sample size to add power to statistical inferences and make conclusions more robust.

Lastly, in some recent research it has been argued that enhanced attachment effects are seen when attachment schemata are activated through the use of priming stimuli (e.g. Rowe & Carnelley, 2003; Carnelley & Rowe, 2007; Carnelley & Rowe, 2010). Examples of priming techniques might include asking participants to write about memories of feeling supported by an attachment figure or subliminally exposing participants to words or pictures related to secure attachment. Such priming results in more positive mood, views of the self, relationship expectations and greater felt security. It also tends to enhance expected patterns of attachment. In this study, the effects of secure priming would likely result in an enhancement of the differences between therapists and non-therapists; therapists would arguably tend towards the "dampening" of attachment behaviours seen above, but non-therapists might exhibit even greater magnitude in their observed attachment behaviours. Future research should therefore consider the use of priming techniques to explore their effect in therapists.

## *7. Conclusion*

This study has found that therapists appear to exhibit a greater tendency to process more thoroughly certain aspects of social and emotional information compared to non-therapists. This is evidenced by a greater proclivity to use elaborative mental state language in describing emotional situations and by a greater focus on social cues in a visual assessment of the same situations. Therapists also demonstrate a self-reported higher level of affective and cognitive empathic ability than non-therapists. However, in behavioural terms, therapists do not evidence a significantly enhanced ability in traditional Theory of Mind tasks, emotion understanding, or visual perspective taking tasks. This suggests that, whilst in this particular study the possession of mentalizing skills is at similar levels for both therapists and non-therapists, therapists are significantly better at using those skills. The discovery that therapists are generally better at some aspects of mentalizing but not others was made possible in this study because of the breadth of known mentalizing measures used since data from the more novel, and arguably more subtle, measures such as eye-tracking in social/non-social stimuli tasks (Fletcher Watson et al., 2009) or the mental state language task (Ruffman et al., 2002; Slaughter et al., 2007) were able to distinguish group differences between therapists and non-therapists. Notwithstanding that the study has added substantially to the existing knowledge concerning therapist mentalizing and attachment, there are many questions of

interest and scope for future research that have arisen as a result of the study's findings and its acknowledged limitations.

The implications of these findings are relevant for both practice and training. The data suggests that extensive training, including self-reflection, generally fosters an ability to overcome one's attachment related biases sufficiently such that any response to emotional or attachment related information is appropriate in the context of therapy. However, if the therapists' attachment style is avoidant, he or she should be aware that there are elements of avoidant attachment behaviours which are not so easily overcome and that may pertain even if at a surface level those behaviours are identified and dealt with. For training programmes, this data suggests that therapist trainees would do well to consider their individual attachment styles, particularly an avoidant style, and reflect on how they may influence their clinical practice. An obvious way of doing this is by means of personal therapy and it is suggested that training programmes would do well to consider directing trainees to explore attachment as a specific subject within their personal therapeutic journey.

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**Appendix 1**

**Qualification details of participants**

**A. Therapists**

| Participant number | Gender | Age | Ethnicity | Qualification |
|---|---|---|---|---|
| 1 | F | 31 | White British | PsychD, Counselling Psychology |
| 2 | F | 60 | White British | MSc, Counselling Psychology |
| 4 | M | 56 | Chinese | MSc, Advanced Counselling Psychology |
| 5 | F | 30 | White British | PsychD, Counselling Psychology |
| 6 | F | 50 | White British | PsychD, Counselling Psychology |
| 7 | F | 29 | Asian Indian/ Asian British Indian | PsychD, Counselling Psychology |
| 8 | F | 31 | White other/European | PsychD, Counselling Psychology |
| 9 | M | 33 | White other/European | PsychD, Counselling Psychology |
| 10 | F | 28 | White British | PsychD, Counselling Psychology |
| 11 | F | 37 | White British | Certified Professional Counselling and Coaching (non-British award) |
| 12 | F | 29 | White British | PsychD, Counselling Psychology |
| 13 | F | 34 | White British | PsychD, Counselling Psychology |
| 14 | M | 37 | White British | MSc, Integrative Psychotherapy |
| 15 | M | 32 | White British | PsychD, Counselling Psychology |
| 16 | M | 34 | White other/European | MSc, Integrative Psychotherapy |
| 17 | M | 46 | White British | MSc, Counselling Psychology |
| 18 | M | 34 | White British | MSc, Counselling Psychology |
| 19 | F | 51 | Other black background | PsychD, Counselling Psychology |
| 37 | F | 51 | White British | PsychD, Counselling Psychology |
| 47 | F | 41 | White other/European | Postgraduate degree in Family Orientation (non-British award) |

**B. Non-therapists**

| Participant number | Gender | Age | Ethnicity | Qualification |
|---|---|---|---|---|
| 31 | M | 42 | White British | Dphil |
| 32 | F | 46 | White British | LGSM (Guildhall) |
| 33 | F | 41 | White British | Mphil |
| 34 | M | 49 | Asian Indian/ Asian British Indian | MA Law |
| 35 | F | 45 | White British | MA Medical Science |
| 36 | M | 51 | White British | MBA |
| 38 | F | 51 | White British | MBA |
| 39 | F | 46 | White British | Master of Wine (MW) |
| 40 | F | 49 | White British | PGCE |
| 41 | F | 44 | Other Asian/ Asian British | MBA |
| 42 | M | 46 | Chinese | MBA |
| 43 | F | 48 | White British | DipBA |
| 44 | F | 45 | White British | MRSCP Physiotherapy |
| 45 | F | 38 | White British | Unspecified Masters level degree |
| 46 | M | 47 | White British | PGCert Property Finance |
| 48 | F | 46 | Chinese | MBA |
| 49 | F | 41 | White British | MA |
| 50 | F | 37 | White British | ACA |
| 51 | F | 42 | White British | ACA |
| 52 | F | 43 | White British | DipBA |
| 53 | F | 43 | White other/European | MBA |

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# MEMORANDUM

**TO:** Mary Hill
**CC:** Dr. Gela Richards
**CC:** Dr. Lance Slade

**FROM:** Dr. Caroline Ross

**DATE:** 2nd December 2009

**SUBJECT:** Ethics Application (Ref: PT 09/ 024)

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I am pleased to advise you that the School Ethics Committee has made the following decision with regard to the Ethics Application for your project entitled:

**"Counsellor Attachment Orientation and its Relationship with Empathy, Mental State Understanding and Perspective Taking."**

**1: Approved** ☑
**2: Approved with Minor Conditions/ Revisions** ☐
**3: Approved with Major Conditions/ Revisions** ☐
**4: Rejected** ☐

**Details of this decision will be passed on to the University Ethics Board for ratification, who will contact you directly by email regarding this.**
**IMPORTANT: Please note that the decision of the School Ethics Committee is given pending ratification by the University Ethics Board, and you may not proceed with your research until you receive notification that your application has been approved by them.**

**Conditions/ Revisions:**

The Deputy Chair of the School Ethics Committee (Dr. Caroline Ross) or of your Subject Area Ethics Working Group (Dr. Dennis Greenwood) will be happy to provide any further feedback to you.

Please could you confirm with Lemady Rochard, Secretary to the University Ethics Board, and the chair of your Subject Area Ethics Working Group once you have successfully met any conditions imposed.

With very best wishes for a successful project,

Dr. Caroline Ross
**(Chair HALS School Ethics Committee)**

Subj: **Ethics Application - Hill, Mary**
Date: 15/12/2009 16:29:22 GMT Standard Time
From: L.Rochard@roehampton.ac.uk
To: clippingdale@aol.com, hillma@roehampton.ac.uk
CC: Jan.Harrison@roehampton.ac.uk, g.richards@roehampton.ac.uk, L.Slade@roehampton.ac.uk, S.Farnfield@roehampton.ac.uk

Dear Mary,

**Applicant:** **Mary Hill (research student)**
**School:** **Human and Life Sciences**
**Ref:** **PT 09/ 024**
**Title:** **Counsellor Attachment Orientation and its Relationship with Empathy, Mental State Understanding and Perspective Taking.**

The Ethics Board has now considered the above ethics application. I am pleased to inform you that this application has been approved. We do not require anything further in relation to this.

Many thanks,

Lemady

Lemady Rochard
Research Policy Officer
Research and Business Development Office
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PARTICIPANT CONSENT FORM

**Title of research project: Counsellor Attachment Orientation and its Relationship with Empathy, Mental State Understanding and Perspective Taking.**

**Brief description of research project:**

The aim of the research is to shed further light on arguably the most important aspect in the relational model of counselling, that is, the relationship between client and counsellor. Drawing on the underlying theory that successful therapy relies on the ability of the therapist to act as a secure base for exploration, the research will investigate the relationship between therapist attachment styles and other relational attributes that therapists may possess and utilise in order to engage with clients, for example, empathic ability, mental state understanding and perspective taking. In so doing, the aim will be to evaluate how the therapist attachment style may be influencing his or her connection with the client through such relational experiences.

During this research you will be given a number of experimental tasks measuring mental state understanding, emotion understanding and perspective taking. You will also be given four questionnaires. The individual tasks and questionnaires are quite short in duration and, overall, your participation will take approximately one hour and 20 minutes. There are nine tasks or questionnaires in total.

The first questionnaire will ask you basic details about your age, gender, and mother's educational background etc. The second questionnaire will ask you about more detailed accounts of your relationships i.e. 'how you are' or 'how you would be' in an intimate relationship with someone. The third, fourth and fifth will ask you to comment in response to a range of social situations.

The experimental tasks involve different procedures. The first task will show a series of everyday pictures and you will be asked to describe (verbally) what you see in the picture shown. The second task will be a series of pictures showing four emotional faces with a word in the middle and you will be asked to match the word to one of the faces. The third task will involve undertaking various actions with respect to certain objects. The fourth task asks you to look at a series of images of eyes, surrounded by four words. You will be asked to match a word to the pair of eyes shown. The tasks will not necessarily follow in this order. In some of these tasks, your eye gaze will be tracked using a safe, non-invasive and unobtrusive eyetracking camera. In addition, your responses on some of the tasks may be audio-recorded.

You need not answer any or all of the questions if you feel uncomfortable with them. You will be given an identification number and all the information taken in this research will be anonymous as no names will be linked to the task answer-sheets. The signature on this sheet will be kept separate from the task papers. You will be debriefed at the end of all the tasks. You will be reimbursed up to £20 for your time and expenses.

You may withdraw from this study at any time, without any explanation. If you wish to withdraw your data will be removed from the data file, although the research data will continue to be held in aggregate form.

You may ask the researcher for feedback on your scores on the questionnaire that measures attachment styles. Should you wish to do this, further details will be given to you after the tests have taken place during debriefing.

This research will be conducted according to the British Psychological Society Code of Ethics and Conduct (August 2009).

**Investigator Contact Details:**

Mary Hill
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Whitelands College
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SW15 4JD
Email: hillma@roehampton.ac.uk
Tel: 07769 972716

**Consent Statement:**

I agree to take part in this research, and am aware that I am free to withdraw at any point. I understand that the information I provide will be treated in confidence by the investigator and that my identity will be protected in the publication of any findings.

Name ……..

Signature ……

Date ……

Please note: if you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However if you would like to contact an independent party please contact the Dean of School (or if the researcher is a student you can also contact the Director of Studies.)

**Director of Studies Contact Details:**
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Tel: 020 8392 3617

DEBRIEF FOR COUNSELLORS – TO BE TAKEN AWAY BY PARTICIPANT

**Title of research project: Counsellor Attachment Orientation and its Relationship with Empathy, Mental State Understanding and Perspective Taking.**

Brief description of research project:

Thank you for completing the tasks in this research. The aim of the research is to shed further light on arguably the most important aspect in the relational model of counselling, that is, the relationship between client and counsellor. Drawing on the underlying theory that successful therapy relies on the ability of the therapist to act as a secure base for exploration, the research will investigate the relationship between therapist attachment styles and other relational attributes that therapists may possess and utilise in order to engage with clients, for example, empathic ability, mental state understanding and perspective taking. In so doing, the aim will be to evaluate how the therapist attachment style may be influencing his or her connection with the client through such relational experiences.

**Participant ID number:** _____

**Investigator Contact Details:**
Mary Hill
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SW15 4JD
Email: hillma@roehampton.ac.uk
Tel: 07769 972716

It may be that our interview has brought up some difficult feelings or memories for you. I am unable to offer a counselling session, but should any issue have arisen for which you may need more specialist support than I am able to offer, I would recommend that you take this to your personal therapist or supervisor where appropriate. You may also find the following contacts useful:

British Psychological Society (BPS)
Web: http://www.bps.org.uk/bps/e-services/find-a-psychologist/directory.cfm
Tel: 0116 254 9568

British Association for Counselling and Psychotherapy (BACP)
Web: http://www.bacp.co.uk/wam/SeekTherapist.exe?NEWSEARCH
Tel: 0870 443 5252 or 01455 883300

United Kingdom Council of Psychotherapists (UKCP)
Web: http://www.psychotherapy.org.uk/find_a_therapist.html
Tel: 020 7014 9955

Should you wish to receive feedback on your attachment orientation, please email Mary Hill on the above address, stating your ID number given above. If you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However if you would like to contact an independent party please contact the individuals named below:

**Director of Studies Contact Details:**
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**Participant ID number:** _____

**Investigator Contact Details:**
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Web: http://www.bacp.co.uk/wam/SeekTherapist.exe?NEWSEARCH
Tel: 0870 443 5252 or 01455 883300

United Kingdom Council of Psychotherapists (UKCP)
Web: http://www.psychotherapy.org.uk/find_a_therapist.html
Tel: 020 7014 9955

Should you wish to receive feedback on your attachment orientation, please email Mary Hill on the above address, stating your ID number given above. If you have a concern about any aspect of your participation or any other queries please raise this with the investigator. However if you would like to contact an independent party please contact the individuals named below:

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**Appendix 4**

**Demographic Questionnaire**

**Yourself**

Gender: M / F Age: _____ I.D. no._____ Is English your first language? Y / N

Ethnicity: _____

Date and title of qualification: _____

Preferred therapeutic model (if applicable): _____

Approximate no. of client hours (if applicable): _____

**Family**

Age of mother when you were born: _____ Number of siblings: _____

| | | | |
|---|---|---|---|
| Date of Birth & Gender of Each: | Sibling 1. | DOB/Age: _____ | M / F |
| (Starting with the oldest) | Sibling 2. | DOB/Age: _____ | M / F |
| | Sibling 3. | DOB/Age: _____ | M / F |
| | Sibling 4. | DOB/Age: _____ | M / F |

**Growing up (0 – 11 years)**

Parental marital status: _____

Mother's occupation: _____

Mother's education (eg. Completed GCSE's, A' Levels, College, University, Post-grad):

Father's occupation: _____

Father's education: _____

Did the marital status of your parents change during this period? **Yes / No**

If yes, how did it change and how old were you? _____

**Adolescence (12 – 18years)**

Parental marital status: _____

Mother's occupation: _____

Mother's education:_____

Father's occupation: _____

Father's education: _____

Did the marital status of your parents change during this period? **Yes / No**

If yes, how did it change and how old were you? _____

**Now**

Parental marital status: _____

Mother's occupation: _____

Mother's education: _____

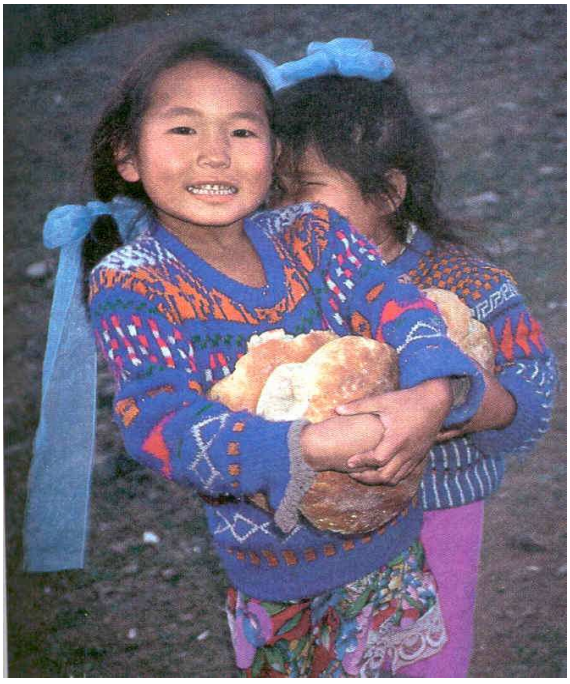
Father's occupation: _____

Father's education: _____

Has the marital status of your parents change during this period? **Yes / No**

If yes, how did it change and how old were you? _____

**Examples of the Everyday Pictures stimuli (Ruffman et al., 2002)**



## Coded words

## Appendix 6

| Cognitive | Desire | Emotion | Physical | Care | Modulation of assertion |
|---|---|---|---|---|---|
| Amusing | Avoiding | Afraid | Agitated | Arm around | Bet |
| Attention/ding | Disagreeable | Aggressive | Animated | Care | Certainly |
| Aware | Distaste | Alarm | Bawling | Carrying child/ baby | Could be |
| Believe | Doesn't like | Angry | Berating | Clutching baby | Definitely |
| Cheating | Doesn't want | Amused | Burying face | Concerned about | Expect |
| Cheeky | Hope to/for | Annoyed | Caress | Hand wrapped round | Figure |
| Communicate | Indifferent | Anxious/Worried | Clinging | Help | Guess |
| Concentrating | Insistent | Apprehensive | Crying | Holding child/ baby/woman | Maybe |
| Confused | Like/s | Ashamed | Drawing away | Holding close | Might |
| Conscious | Loving | Awe | Embrace | Protecting | Must |
| Curious | Not having it | Bothered | Exclaiming | | Perhaps |
| Detached | Objecting | Calm | Eyes closed/shut | | Possibly |
| Distant | Resist/ing | Challenging | Eyes wrinkled/ Scrunched | | Probably |
| Distracted | Unwilling | Comfortable | Flexing neck muscles | | Reckon |
| Engage/d | Want/s | Concerned | Flushed cheeks | | Suppose |
| Engrossed | | Confident | Friendly block | | Sure |
| Exaggerating | | Coy | Giggle | | Wonder |
| Faking | | Critical | Give a kiss | | |
| Focus/sing/sed | | Cross | Grabbing | | |
| Guessing | | Defensive | Grimacing | | |
| Hide/Hiding/Cover | | Delighted | Grin/ning | | |
| Hilarious | | Disapproving | Gripping | | |
| Ignore/ing | | Disgust/ed | Holding tightly | | |
| Imagine | | Displeasure | Hug | | |
| Inebriated | | Distressed | Kiss | | |
| Inquisitive | | Ecstatic | Laugh/ing/ter | | |
| Inspecting | | Embarrassing | Leaning away | | |
| Instruct | | Enjoy/ing | Lips puckered/up | | |
| Interest/ed | | Excited | Looking avidly | | |
| Jest | | Fed up | Lunging in | | |
| Jocular | | Forceful | Making a fuss/ noise/a face | | |
| Joke/joking | | Frightened | Mouth open | | |
| Know/Don't know | | Gleeful | Neck tightened | | |
| Larking about | | Good mood | Nestling into | | |
| Listen/ing | | Grumpy | Nose wrinkled/ Scrunched | | |
| Looking forward | | Happy | Pulling away | | |
| Mischievous | | Harsh | Pulling towards | | |
| Mock | | Horror | Quiet | | |
| Nag | | Irritation | Raising voice | | |
| Notice/ing | | Jaunty | Recoiling | | |
| Observe/ing | | Nervous | Screaming | | |
| Paying attention | | Perturbed | Screwing face | | |
| Peek/ing | | Pleased | Seeking a kiss | | |
| Play/ful/ing | | Proud | Shielding | | |
| Playing up | | Repulsed | Shouting | | |
| Presume | | Responsible | Showing teeth | | |
| Pretending | | Sad | Shying away | | |
| Posing/ed | | Safe | Smile/ing | | |
| Puzzled | | Scared/scary | Smiley eyes | | |
| Questioning | | Serious | Snappy | | |
| Self conscious | | Shame | Squirming away | | |
| Self contained | | Surprised | Staring at | | |
| Sensible | | Sympathy | Struggling | | |
| Shock/ed | | Tense | Temper tantrum | | |
| Startled | | Tentative | Tensing neck muscles | | |
| Steal | | Terrified | Trying to kiss | | |
| Studious | | Traumatised | Veins protruding | | |
| Suppose | | Unconcerned | Yelling | | |
| Teasing | | Under duress | | | |
| Think/ing | | Unhappy | | | |
| Unaware | | Unsafe | | | |
| Understand/ing | | Upset | | | |
| Wondering | | Violated | | | |

**ExampleTranscription for Everyday Pictures Task**

Participant number: 10

Recording number: A174 check (3m 48s)

Which set of pictures?

Transcription

1. Er, it's a group of five children, one is in the background, um, it's a little toddler crying on the floor with a bib around his neck, um, three of the children seem quite interested in the little baby, um, whether they're concerned or not I don't know, but they're looking at him. One is looking at the floor sort of next to the baby so he doesn't look so interested. I think they're in some sort of classroom or something with little chairs and tables, um, wearing dungarees and cute little things, um…that's about it I think.

2. Um, this one's of two little girls, must be about 7, I imagine, not sure, but they're wearing their school uniform, both got little pig tails. One is looking like she's cheating on a test and looking over the girls shoulder next to her, um, and writing on her own page, so I think they're in some sort of exam environment.

3. This one is of an old couple by the looks of it, under some mistletoe, um, the woman is grimacing because the man is trying to kiss her, um, but she looks like she's quite enjoying it as well, like a bit of a joke, so and there, there's just a flowery background. Looks like quite a nice atmosphere I suppose.

4. Er, this one is er a lady with her baby crossing some sort of valley or something on a bridge. She looks quite frightened and the baby is sort of clinging to her, um…she's holding one of the handrails and she looks like she's trying to cross this valley of the bridge but struggling to do so. Looks like quite a warm place, she's not wearing that much, um, there's some people behind her following her, she looks like she's struggling.

5. And this is of two girls, they look Vietnamese or Chinese or something, um, they're holding little loaves of bread and smiling at the photographer, um, one of them's hiding behind the other, which, and she looks a bit older, um the one in front's a bit older, um and they look like they're just happy for some reason. They've got bows in their hair, wearing quite nice patterned jumpers.

6. This one looks like a picture that's been sort of false taken or done on purpose because there's a little boy pouring a bucket of water over a man's head on the beach and he's laughing and his wife or whoever it is is laughing as well. There's the three of them in the photo, parasol behind

them. Couple of people in the background walking on the beach. Um, it looks like it's a bit staged, like a holiday pic or something.

7. Um, this one is of two people sitting on a couch. It looks like father and son or daughter, can't really tell, um, the father looks like he's reading his paper but he's starting to have a go at whoever it is, son or daughter, and the other person is just looking down onto whatever they've got in their lap. So it looks like quite a tense atmosphere, there's not much on the walls, it's quite bleak.

| Picture | Cognitive | Desire | Emotion | Physical | Care | Modulation of assertion |
|---|---|---|---|---|---|---|
| 1 | Interested (2)<br>Know<br>Think | | Concerned | Crying | | |
| 2 | Cheating<br>Think | | | | | Must<br>Sure |
| 3 | | | Enjoying | Grimacing<br>Trying to kiss | | Suppose |
| 4 | | | Frightened | Clinging<br>Struggling | | |
| 5 | Hiding | | Happy | Smiling | | |
| 6 | | | | Laughing (2) | | |
| 7 | | | Tense | | | |
| Total | 7 | 0 | 5 | 8 | 0 | 3 |

Mental state language range

Cheating, clinging, concerned, crying, enjoying, frightened, grimacing, happy, interested, hiding, know, laughing, must, smiling, struggling, suppose, sure, tense, think, trying to kiss.

20

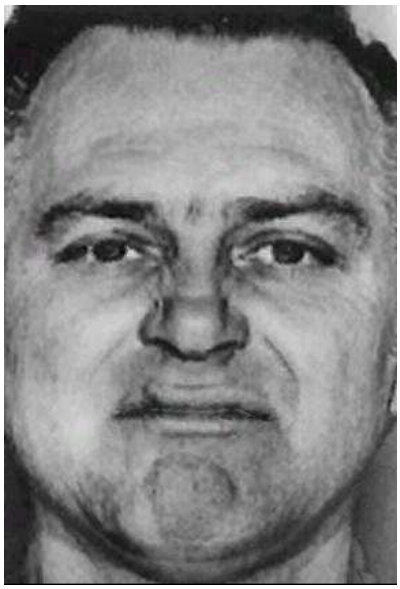
Elaboration/clarification

1. 2
2. 1
3. 2
4. 1
5. 0
6. 0
7. 0

Total = 6

**Appendix 8**

**Examples of facial emotion stimuli**



Male face – disgust

Female face – angry

**LEAS-A items**

1) A neighbour asks you to repair a piece of furniture. As the neighbour looks on, you begin hammering the nail but then miss the nail and hit your finger. How would you feel? How would the neighbour feel?

2) A loved one gives you a back rub after you return from a hard day's work. How would you feel? How would your partner feel?

3) As you drive over a suspension bridge you see a person standing on the other side of the guardrail, looking down at the water. How would you feel? How would the person feel?

4) Your boss tells you that your work has been unacceptable and needs to be improved. How would you feel? How would your boss feel?

5) You are standing in line at the bank. The person in front of you steps up to the window and begins a very complicated transaction. How would you feel? How would the person in front of you feel?

6) You have been working hard on a project for several months. Several days after submitting it, your boss stops by to tell you that your work was excellent. How would you feel? How would your boss feel?

7) Your dentist has told you that you have several cavities and schedules you for a return visit. How would you feel? How would the dentist feel?

8) Your doctor told you to avoid fatty foods. A new colleague at work calls to say that she/he is going out for pizza and invites you to go along. How would you feel? How would your colleague feel?

9) You and a friend agree to invest money together to begin a new business venture. Several days later you call the friend back only to learn that she/he changed her/his mind. How would you feel? How would your friend feel?

10) You fall in love with someone who is both attractive and intelligent. Although this person is not well off financially, this doesn't matter to you – your income is adequate. When you begin to discuss marriage, you learn that she/he is actually from an extremely wealthy family. She/he did not want that known for fear that people would only be interested in her/him for her/his money. How would you feel? How would she/he feel?

**Examples of the "Eyes Test" stimuli (Baron-Cohen et al., 2001), with correct answers**

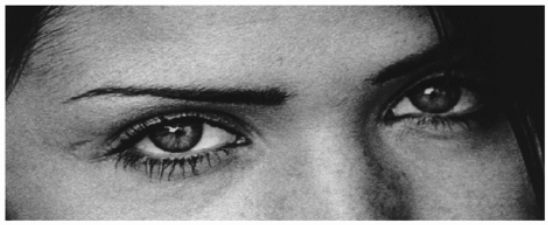
**a) playful**

playful comforting

irritated bored

joking flustered

**b) desire**



desire convinced

apologetic friendly

**c) uneasy**

uneasy dispirited

**The ECR** **Appendix 11**

The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Circle one of the numbers provided for each item, using the scale from 1 (disagree strongly) to 7 (agree strongly):

| | | Disagree Strongly | | | Neutral / Mixed | | | Agree Strongly |
|---|---|---|---|---|---|---|---|---|
| 1. | I prefer not to show a partner how I feel deep down. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | I worry about being abandoned. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | I am very comfortable being close to romantic partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | I worry a lot about my relationships. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Just when my partner starts to get close to me I find myself pulling away. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | I worry that romantic partners won't care about me as much as I care about them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | I get uncomfortable when a romantic partner wants to be very close. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | I worry a fair amount about losing my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | I don't feel comfortable opening up to romantic partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | I often wish that my partner's feelings for me were as strong as my feelings for him/her. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | I want to get close to my partner, but I keep pulling back. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | I often want to merge completely with romantic partners, and this sometimes scares them away. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | I am nervous when partners get too close to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | I worry about being alone. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | I feel comfortable sharing my private thoughts and feelings with my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | My desire to be very close sometimes scares people away. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | I try to avoid getting too close to my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | I need a lot of reassurance that I am loved by my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | I find it relatively easy to get close to my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | Sometimes I feel that I force my partners to show more feeling, more commitment. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | I find it difficult to allow myself to depend on romantic partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. | I do not often worry about being abandoned. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. | I prefer not to be too close to romantic partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. | If I can't get my partner to show interest in me, I get upset or angry. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. | I tell my partner just about anything. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. | I find that my partner(s) don't want to get as close to me as I would like. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. | I usually discuss my problems and concerns with my partner. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 28. | When I'm not involved in a relationship, I feel somewhat anxious and insecure. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 29. | I feel comfortable depending on romantic partners. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 30. | I get frustrated when my partner is not around as much as I would like. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31. | I don't mind asking romantic partners for comfort, advice, or help. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 32. | I get frustrated if romantic partners are not available when I need them. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 33. | It helps to turn to my romantic partners in times of need. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 34. | When romantic partners disapprove of me, I feel really bad about myself. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 35. | I turn to my partner for many things, including comfort and reassurance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 36. | I resent it when my partner spends time away from me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**IRI items (answered on a 5 point Likert scale)**

1. I daydream and fantasize, with some regularity, about things that might happen to me.
2. I often have tender, concerned feelings for people less fortunate than me.
3. I sometimes find it difficult to see things from the "other guy's" point of view.
4. Sometimes I don't feel very sorry for other people when they are having problems.
5. I really get involved with the feelings of characters in a novel.
6. In emergency situations, I feel apprehensive and ill-at-ease.
7. I am usually objective when I watch a movie or a play, and I don't often get completely caught up.
8. I try to look at everybody's side of a disagreement before I make a decision.
9. When I see someone being taken advantage of, I feel kind of protective towards them.
10. I sometimes feel helpless when I am in the middle of a very emotional situation.
11. I sometimes try to understand my friends by imagining how things look from their perspective.
12. Becoming extremely involved in a good book or movie is somewhat rare for me.
13. When I see someone get hurt, I tend to remain calm.
14. Other people's misfortunes do not usually disturb me a great deal.
15. If I'm sure I'm right about something, I don't waste time listening to other people's arguments.
16. After seeing a play or a movie, I have felt as though I were one of the characters.
17. Being in a tense emotional situation scares me.
18. When I see someone being treated unfairly, I sometime don't feel very much pity for them.
19. I am usually pretty effective in dealing with emergencies.
20. I am often quite touched by things that I see happen.
21. I believe that there are two sides to every question and try to look at them both.
22. I would describe myself as a pretty soft-hearted person.
23. When I watch a good movie, I can easily put myself in the place of a leading character.
24. I tend to lose control during emergencies.
25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while.
26. When I am reading an interesting story or novel, I imagine how *I* would feel if the events in the story were happening to me.
27. When I see someone who badly needs help in an emergency, I go to pieces.
28. Before criticising somebody, I try to imagine how *I* would feel if I were in their place.

**The EQ** **Appendix 13**

| | | | | |
|---|---|---|---|---|
| 1. I can easily tell if someone else wants to enter a conversation. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 2. I find it difficult to explain to others things that I understand easily, when they don't understand it first time. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 3. I really enjoy caring for other people. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 4. I find it hard to know what to do in a social situation. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 5. People often tell me that I went too far in driving my point home in a discussion. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 6. It doesn't bother me too much if I am late meeting a friend. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 7. Friendships and relationships are just too difficult, so I tend not to bother with them. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 8. I often find it difficult to judge if something is rude or polite. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 9. In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 10. When I was a child, I enjoyed cutting up worms to see what would happen. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 11. I can pick up quickly if someone says one thing but means another. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 12. It is hard for me to see why some things upset people so much. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 13. I find it easy to put myself in somebody else's shoes. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 14. I am good at predicting how someone will feel. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 15. I am quick to spot when someone in a group is feeling awkward or uncomfortable. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 16. If I say something that someone else is offended by, I think that that's their problem, not mine. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 17. If anyone asked me if I liked their haircut, I would reply truthfully, even if I didn't like it. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 18. I can't always see why someone should have felt offended by a remark. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 19. Seeing people cry doesn't really upset me. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 20. I am very blunt, which some people take to be rudeness, | Strongly | Slightly | Slightly | Strongly |

| | | | | |
|---|---|---|---|---|
| even though this is unintentional. | agree | agree | disagree | disagree |
| 21. I don't tend to find social situations confusing. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 22. Other people tell me I am good at understanding how they are feeling and what they are thinking. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 23. When I talk to people, I tend to talk about their experiences rather than my own. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 24. It upsets me to see an animal in pain. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 25. I am able to make decisions without being influenced by people's feelings. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 26. I can easily tell if someone else is interested or bored with what I am saying. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 27. I get upset if I see people suffering on news programmes. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 28. Friends usually talk to me about their problems as they say that I am very understanding. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 29. I can sense if I am intruding, even if the other person doesn't tell me. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 30. People sometimes tell me that I have gone too far with teasing. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 31. Other people often say that I am insensitive, though I don't always see why. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 32. If I see a stranger in a group, I think that it is up to them to make an effort to join in. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 33. I usually stay emotionally detached when watching a film. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 34. I can tune into how someone else feels rapidly and intuitively. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 35. I can easily work out what another person might want to talk about. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 36. I can tell if someone is masking their true emotion. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 37. I don't consciously work out the rules of social situations. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 38. I am good at predicting what someone will do. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 39. I tend to get emotionally involved with a friend's problems. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |
| 40. I can usually appreciate the other person's viewpoint, even if I don't agree with it. | Strongly agree | Slightly agree | Slightly disagree | Strongly disagree |

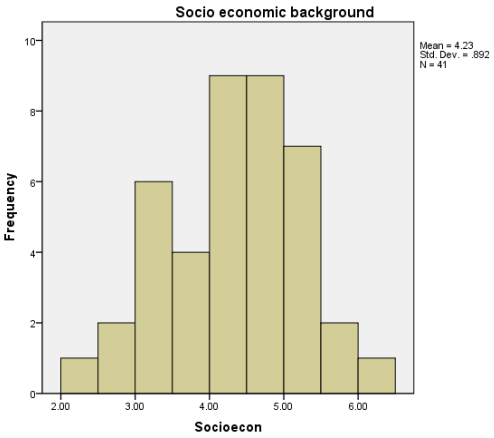
**The AQ** **Appendix 14**

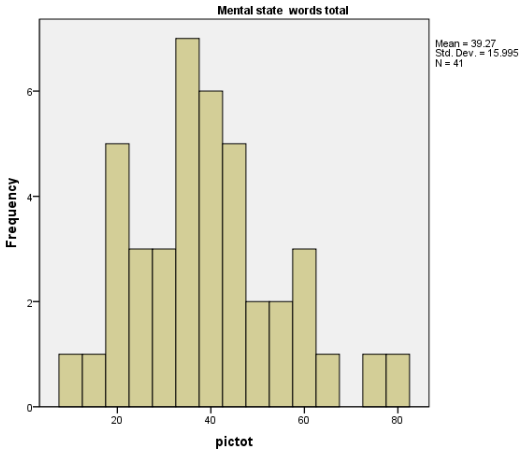
| | | | | |
|---|---|---|---|---|
| 1. I prefer to do things with others rather than on my own. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 2. I prefer to do things the same way over and over again. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 3. If I try to imagine something, I find it very easy to create a picture in my mind. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 4. I frequently get so strongly absorbed in one thing that I lose sight of other things. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 5. I often notice small sounds when others do not. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 6. I usually notice car number plates or similar strings of information. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 7. Other people frequently tell me that what I've said is impolite, even though I think it is polite. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 8. When I'm reading a story, I can easily imagine what the characters might look like. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 9. I am fascinated by dates. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 10. In a social group, I can easily keep track of several different people's conversations. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 11. I find social situations easy. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 12. I tend to notice details that others do not. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 13. I would rather go to a library than a party. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 14. I find making up stories easy. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 15. I find myself drawn more strongly to people than to things. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 16. I tend to have very strong interests which I get upset about if I can't pursue. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 17. I enjoy social chit-chat. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 18. When I talk, it isn't always easy for others to get a word in edgeways. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 19. I am fascinated by numbers. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 20. When I'm reading a story, I find it difficult to work out the characters' intentions. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 21. I don't particularly enjoy reading fiction. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 22. I find it hard to make new friends. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 23. I notice patterns in things all the time. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 24. I would rather go to the theatre than a museum. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 25. It does not upset me if my daily routine is disturbed. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 26. I frequently find that I don't know how to keep a | Definitely | slightly | slightly | definitely |

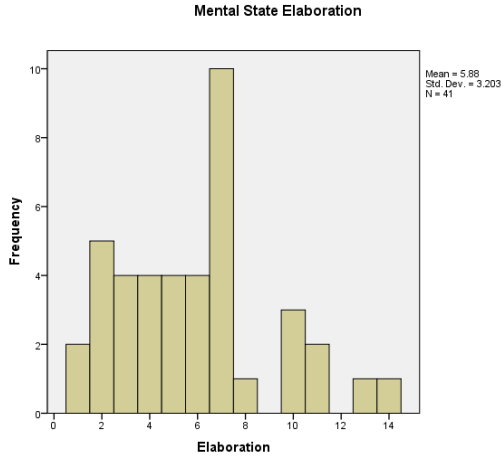
| | | | | |
|---|---|---|---|---|
| conversation going. | agree | agree | disagree | disagree |
| 27. I find it easy to “read between the lines” when someone is talking to me. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 28. I usually concentrate more on the whole picture, rather than the small details. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 29. I am not very good at remembering phone numbers. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 30. I don’t usually notice small changes in a situation, or a person’s appearance. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 31. I know how to tell if someone listening to me is getting bored. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 32. I find it easy to do more than one thing at once. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 33. When I talk on the phone, I’m not sure when it’s my turn to speak. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 34. I enjoy doing things spontaneously. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 35. I am often the last to understand the point of a joke. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 36. I find it easy to work out what someone is thinking or feeling just by looking at their face. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 37. If there is an interruption, I can switch back to what I was doing very quickly. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 38. I am good at social chit-chat. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 39. People often tell me that I keep going on and on about the same thing. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 40. When I was young, I used to enjoy playing games involving pretending with other children. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 41. I like to collect information about categories of things (e.g. types of car, types of bird, types of train, types of plant, etc.). | definitely agree | slightly agree | slightly disagree | definitely disagree |
| 42. I find it difficult to imagine what it would be like to be someone else. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 43. I like to plan any activities I participate in carefully. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 44. I enjoy social occasions. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 45. I find it difficult to work out people’s intentions. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 46. New situations make me anxious. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 47. I enjoy meeting new people. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 48. I am a good diplomat. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 49. I am not very good at remembering people’s date of birth. | Definitely agree | slightly agree | slightly disagree | definitely disagree |
| 50. I find it very easy to play games with children that involve pretending. | Definitely agree | slightly agree | slightly disagree | definitely disagree |

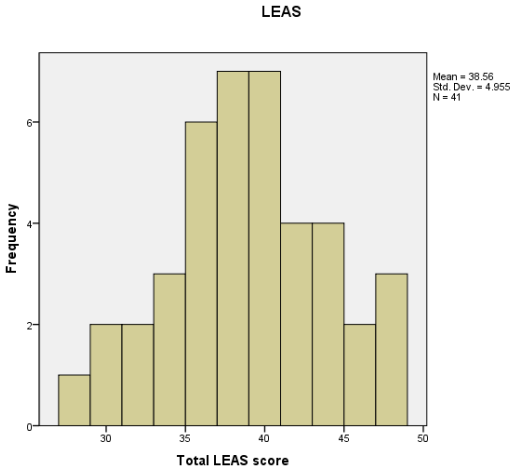
## Histograms of main variables

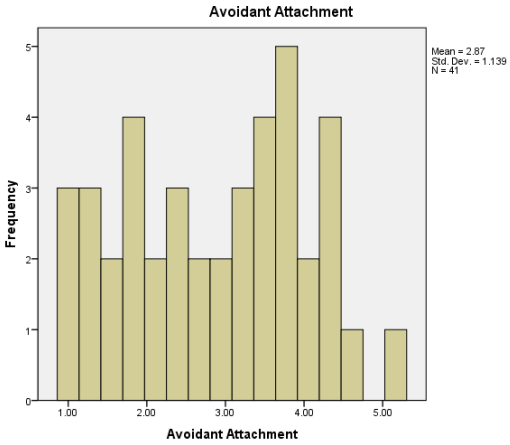
**Appendix 15**

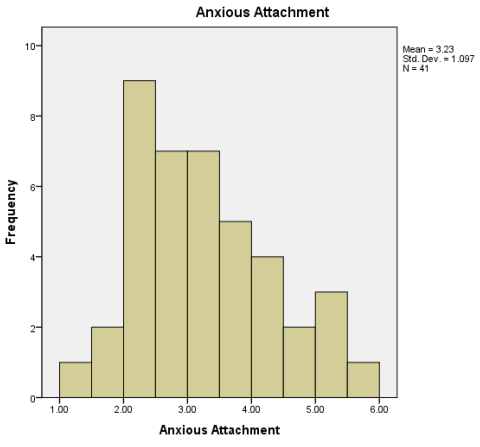


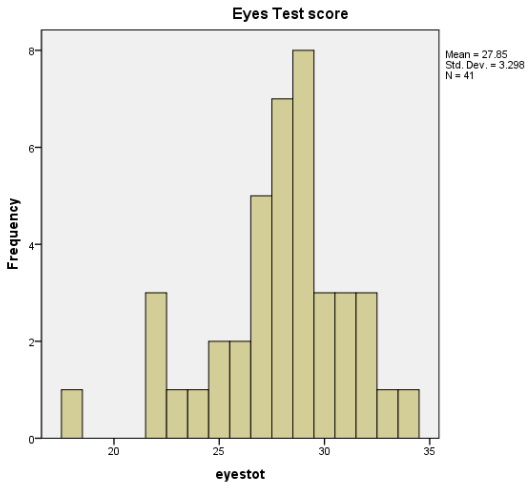



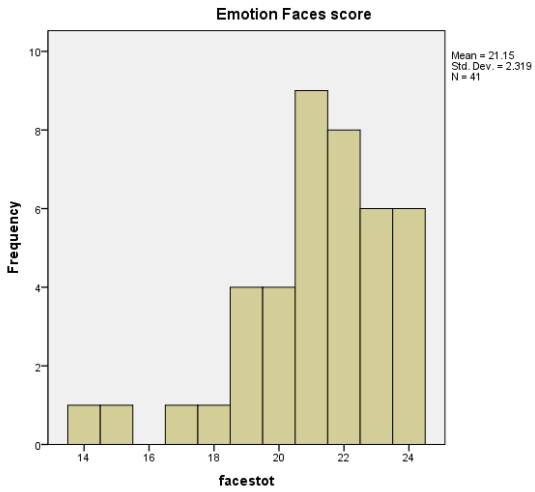



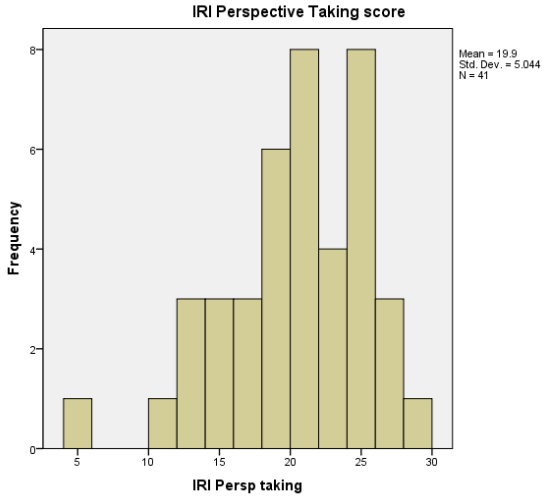



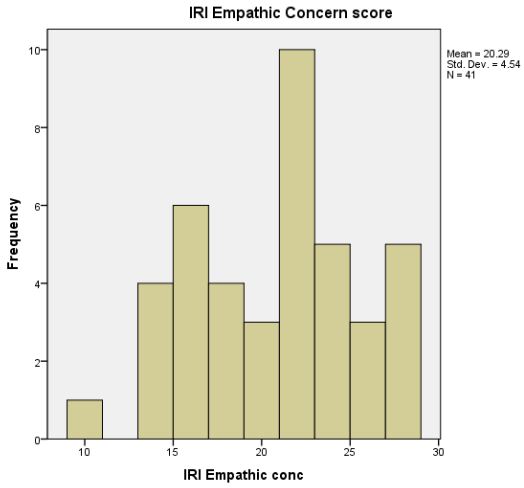



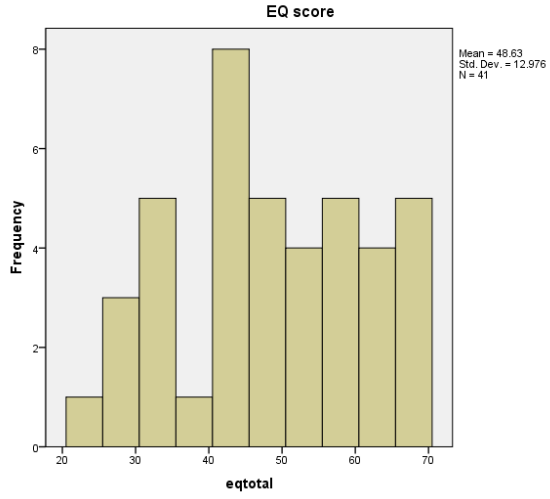



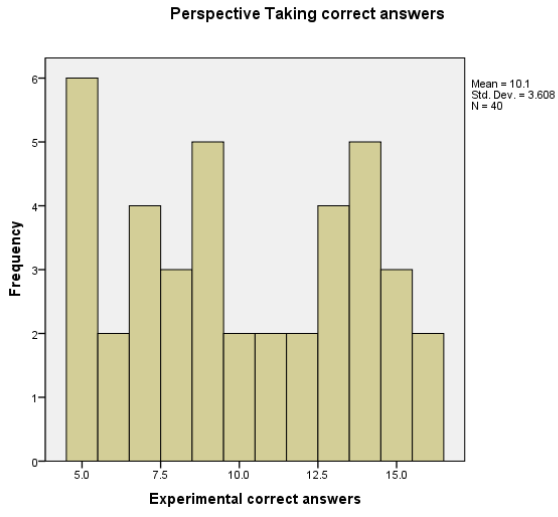

Eyes Test score
Mean = 27.85
Std. Dev. = 3.298
N = 41
Frequency
eyestot


Emotion Faces score
Mean = 21.15
Std. Dev. = 2.319
N = 41
Frequency
facestot


IRI Perspective Taking score
Mean = 19.9
Std. Dev. = 5.044
N = 41
Frequency
IRI Persp taking


IRI Empathic Concern score
Mean = 20.29
Std. Dev. = 4.54
N = 41
Frequency
IRI Empathic conc


EQ score
Mean = 48.63
Std. Dev. = 12.976
N = 41
Frequency
eqtotal


Perspective Taking correct answers
Mean = 10.1
Std. Dev. = 3.608
N = 40
Frequency
Experimental correct answers

**Shapiro-Wilk Tests of normality**

| | Shapiro-Wilk | | |
|---|---|---|---|
| | Statistic | df | Sig. |
| Mental state words | .970 | 41 | .342 |
| Elaboration | .945 | 41 | .046 |
| Total LEAS score | .979 | 41 | .620 |
| Avoidant Attachment | .958 | 41 | .132 |
| Anxious Attachment | .950 | 41 | .067 |
| Eyes Test | .949 | 41 | .065 |
| Emotional Faces | .897 | 41 | .001 |
| IRI Perspective Taking | .952 | 41 | .081 |
| IRI Empathic Concern | .968 | 41 | .292 |
| EQ | .966 | 41 | .260 |
| Perspective taking correct answers | .923 | 40 | .010 |
| Face and hands total fix duration | .909 | 41 | .003 |
| Face and hands first fix duration | .975 | 41 | .486 |

**Spearman rho correlations for the main variables as part of the normality tests** **Appendix 17**

| | | Mental state words | Elaboration | LEAS score | Avoidant Attachment | Anxious Attachment | Eyes | Face emotion | IRI Persp taking | IRI Empathic Conc | EQ | Persp Taking Accuracy | Total fix social info | First fix social info |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mental state words | Correlation Coefficient | 1.000 | .744** | .140 | -.168 | -.072 | -.013 | -.036 | .053 | -.147 | .158 | .111 | .592** | .207 |
| | Sig. (2-tailed) | . | .000 | .382 | .293 | .655 | .937 | .824 | .742 | .360 | .324 | .495 | .000 | .194 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Elaboration | Correlation Coefficient | .744** | 1.000 | .229 | -.287 | .052 | .040 | .050 | .111 | -.012 | .271 | .083 | .404** | .109 |
| | Sig. (2-tailed) | .000 | . | .150 | .069 | .745 | .803 | .758 | .489 | .942 | .087 | .611 | .009 | .499 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| LEAS score | Correlation Coefficient | .140 | .229 | 1.000 | -.124 | .223 | .176 | .204 | .080 | .382* | .263 | .084 | .189 | .105 |
| | Sig. (2-tailed) | .382 | .150 | . | .439 | .161 | .271 | .200 | .618 | .014 | .096 | .606 | .237 | .514 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Avoidant Attachment | Correlation Coefficient | -.168 | -.287 | -.124 | 1.000 | .311* | -.014 | -.110 | -.293 | -.287 | -.569** | -.024 | -.142 | -.204 |
| | Sig. (2-tailed) | .293 | .069 | .439 | . | .048 | .930 | .492 | .063 | .068 | .000 | .885 | .377 | .201 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Anxious Attachment | Correlation Coefficient | -.072 | .052 | .223 | .311* | 1.000 | -.121 | .180 | -.196 | .010 | -.247 | .052 | -.075 | -.008 |
| | Sig. (2-tailed) | .655 | .745 | .161 | .048 | . | .450 | .259 | .220 | .948 | .119 | .751 | .642 | .959 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Eyes | Correlation Coefficient | -.013 | .040 | .176 | -.014 | -.121 | 1.000 | .361* | .131 | .206 | .247 | .226 | .058 | -.078 |
| | Sig. (2-tailed) | .937 | .803 | .271 | .930 | .450 | . | .020 | .414 | .197 | .119 | .161 | .719 | .627 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Face emotion | Correlation Coefficient | -.036 | .050 | .204 | -.110 | .180 | .361* | 1.000 | .115 | .187 | .216 | .096 | .014 | -.002 |
| | Sig. (2-tailed) | .824 | .758 | .200 | .492 | .259 | .020 | . | .472 | .242 | .175 | .557 | .933 | .993 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| IRI Persp taking | Correlation Coefficient | .053 | .111 | .080 | -.293 | -.196 | .131 | .115 | 1.000 | .653** | .547** | .251 | .141 | .084 |
| | Sig. (2-tailed) | .742 | .489 | .618 | .063 | .220 | .414 | .472 | . | .000 | .000 | .118 | .378 | .600 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| IRI Empathic conc | Correlation Coefficient | -.147 | -.012 | .382* | -.287 | .010 | .206 | .187 | .653** | 1.000 | .611** | -.037 | -.086 | -.038 |
| | Sig. (2-tailed) | .360 | .942 | .014 | .068 | .948 | .197 | .242 | .000 | . | .000 | .820 | .595 | .815 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| EQ | Correlation Coefficient | .158 | .271 | .263 | -.569** | -.247 | .247 | .216 | .547** | .611** | 1.000 | .054 | .147 | .309* |
| | Sig. (2-tailed) | .324 | .087 | .096 | .000 | .119 | .119 | .175 | .000 | .000 | . | .743 | .358 | .049 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| Persp taking accuracy | Correlation Coefficient | .111 | .083 | .084 | -.024 | .052 | .226 | .096 | .251 | -.037 | .054 | 1.000 | .215 | .190 |
| | Sig. (2-tailed) | .495 | .611 | .606 | .885 | .751 | .161 | .557 | .118 | .820 | .743 | . | .182 | .239 |
| | N | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| Total fix social info | Correlation Coefficient | .592** | .404** | .189 | -.142 | -.075 | .058 | .014 | .141 | -.086 | .147 | .215 | 1.000 | .711** |
| | Sig. (2-tailed) | .000 | .009 | .237 | .377 | .642 | .719 | .933 | .378 | .595 | .358 | .182 | . | .000 |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |
| First fix social info | Correlation Coefficient | .207 | .109 | .105 | -.204 | -.008 | -.078 | -.002 | .084 | -.038 | .309* | .190 | .711** | 1.000 |
| | Sig. (2-tailed) | .194 | .499 | .514 | .201 | .959 | .627 | .993 | .600 | .815 | .049 | .239 | .000 | . |
| | N | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 41 | 40 | 41 | 41 |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

**Analysis of English as first language**

| | EngFirstLAng | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Mental state words | Yes | 38 | 39.55 | 16.334 | 2.650 |
| | No | 3 | 35.67 | 12.662 | 7.311 |
| Elaboration | Yes | 38 | 5.89 | 3.286 | .533 |
| | No | 3 | 5.67 | 2.309 | 1.333 |
| LEAS score | Yes | 38 | 38.24 | 4.929 | .800 |
| | No | 3 | 42.67 | 3.786 | 2.186 |
| Avoidant Attachment | Yes | 38 | 2.7763 | 1.10882 | .17987 |
| | No | 3 | 4.0556 | .96225 | .55556 |
| Anxious Attachment | Yes | 38 | 3.2030 | 1.12543 | .18257 |
| | No | 3 | 3.6296 | .61195 | .35331 |
| Eyes | Yes | 38 | 27.84 | 3.421 | .555 |
| | No | 3 | 28.00 | 1.000 | .577 |
| Faces Emotion | Yes | 38 | 21.21 | 2.384 | .387 |
| | No | 3 | 20.33 | 1.155 | .667 |
| IRI Perspective taking | Yes | 38 | 19.92 | 5.196 | .843 |
| | No | 3 | 19.67 | 3.055 | 1.764 |
| IRI Empathic concern | Yes | 38 | 20.32 | 4.557 | .739 |
| | No | 3 | 20.00 | 5.292 | 3.055 |
| EQ | Yes | 38 | 48.87 | 13.201 | 2.142 |
| | No | 3 | 45.67 | 11.372 | 6.566 |
| Perspective Taking accuracy | Yes | 37 | 10.00 | 3.629 | .597 |
| | No | 3 | 11.33 | 3.786 | 2.186 |
| Total fix social info | Yes | 38 | 8.3948 | 5.61279 | .91052 |
| | No | 3 | 10.2782 | 1.79873 | 1.03850 |
| First fix social info | Yes | 38 | .5192 | .15669 | .02542 |
| | No | 3 | .7500 | .07792 | .04499 |

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | |
|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference |
| First Fix Social Info | Equal variances assumed | 2.481 | .123 | -2.505 | 39 | .017 | -.23084 |
| | Equal variances not assumed | | | -4.467 | 3.462 | .015 | -.23084 |

**Appendix 19**

**Partial Correlation Analysis of First Fix Eye durations controlling for English as a first language**

| | | First Fix on Social Information Controlling for English as a first language | First Fix on Social Information |
|---|---|---|---|
| Mental state words | Correlation | .233 | .191 |
| | Significance (2-tailed) | .154 | .230 |
| | df | 37 | 41 |
| Elaboration | Correlation | .196 | .166 |
| | Significance (2-tailed) | .232 | .299 |
| | df | 37 | 41 |
| Total LEAS score | Correlation | .064 | .150 |
| | Significance (2-tailed) | .697 | .349 |
| | df | 37 | 41 |
| Avoidant Attachment | Correlation | -.336* | -.203 |
| | Significance (2-tailed) | .037 | .202 |
| | df | 37 | 41 |
| Anxious Attachment | Correlation | -.129 | -.075 |
| | Significance (2-tailed) | .435 | .642 |
| | df | 37 | 41 |
| Eyes | Correlation | -.006 | .010 |
| | Significance (2-tailed) | .969 | .951 |
| | df | 37 | 41 |
| Facial Emotion | Correlation | .056 | .008 |
| | Significance (2-tailed) | .733 | .963 |
| | df | 37 | 41 |
| IRI Persp taking | Correlation | .132 | .116 |
| | Significance (2-tailed) | .424 | .471 |
| | df | 37 | 41 |
| IRI Empathic conc | Correlation | -.025 | -.019 |
| | Significance (2-tailed) | .881 | .904 |
| | df | 37 | 41 |
| EQ | Correlation | .387* | .341* |
| | Significance (2-tailed) | .015 | .029 |
| | df | 37 | 41 |
| Perspective Taking Accuracy | Correlation | .181 | .204 |
| | Significance (2-tailed) | .270 | .207 |
| | df | 37 | 40 |
| Total fix on social information | Correlation | .605** | .601** |
| | Significance (2-tailed) | .000 | .000 |
| | df | 37 | 41 |
| First fix on social information | Correlation | 1.000 | 1 |
| | Significance (2-tailed) | . | |
| | df | 0 | 41 |

**Consideration of age between groups – correlations between age and main variables**

Pearson Correlations

| | | age |
|---|---|---|
| Mental state words | Pearson Correlation | .251 |
| | Sig. (2-tailed) | .113 |
| | N | 41 |
| Elaboration | Pearson Correlation | -.171 |
| | Sig. (2-tailed) | .286 |
| | N | 41 |
| Total LEAS score | Pearson Correlation | -.168 |
| | Sig. (2-tailed) | .293 |
| | N | 41 |
| Avoidant Attachment | Pearson Correlation | .271 |
| | Sig. (2-tailed) | .086 |
| | N | 41 |
| Anxious Attachment | Pearson Correlation | -.163 |
| | Sig. (2-tailed) | .309 |
| | N | 41 |
| Eyes | Pearson Correlation | -.001 |
| | Sig. (2-tailed) | .995 |
| | N | 41 |
| Facial Emotion | Pearson Correlation | .108 |
| | Sig. (2-tailed) | .501 |
| | N | 41 |
| IRI Persp taking | Pearson Correlation | -.157 |
| | Sig. (2-tailed) | .328 |
| | N | 41 |
| IRI Empathic conc | Pearson Correlation | -.277 |
| | Sig. (2-tailed) | .079 |
| | N | 41 |
| EQ | Pearson Correlation | -.277 |
| | Sig. (2-tailed) | .080 |
| | N | 41 |
| Perspective Taking accuracy | Pearson Correlation | -.062 |
| | Sig. (2-tailed) | .706 |
| | N | 40 |
| Total eye fix social info | Pearson Correlation | .024 |
| | Sig. (2-tailed) | .880 |
| | N | 41 |
| First eye fix social info | Pearson Correlation | -.108 |
| | Sig. (2-tailed) | .503 |
| | N | 41 |

**Appendix 21**

**Partial correlations (Pearson, two tailed) of the main variables controlling for age**

| Control Variables | | | Mental State words | Elaboration | LEAS score | Avoidant Attachment | Anxious Attachment | Eyes | Facial Emotion | IRI Persp taking | IRI Empathic conc | EQ | Persp Taking Accuracy | Total eye fix social info | First fix social info |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| age | Mental state words | Correlation | 1.000 | .770 | .238 | -.283 | -.090 | .041 | -.090 | .191 | .054 | .292 | .172 | .702 | .217 |
| | | Significance (2-tailed) | . | .000 | .145 | .081 | .587 | .803 | .586 | .245 | .745 | .071 | .295 | .000 | .184 |
| | | df | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | Elaboration | Correlation | .770 | 1.000 | .186 | -.333 | .002 | -.019 | -.141 | .083 | -.034 | .245 | .063 | .555 | .167 |
| | | Significance (2-tailed) | .000 | . | .257 | .038 | .990 | .910 | .393 | .614 | .836 | .133 | .705 | .000 | .308 |
| | | df | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | LEAS score | Correlation | .238 | .186 | 1.000 | -.070 | .128 | .192 | .253 | -.001 | .330 | .180 | .110 | .288 | .137 |
| | | Significance (2-tailed) | .145 | .257 | . | .673 | .438 | .242 | .120 | .996 | .040 | .274 | .504 | .075 | .406 |
| | | df | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | Avoidant Attachment | Correlation | -.283 | -.333 | -.070 | 1.000 | .367 | -.004 | -.125 | -.189 | -.252 | -.536 | -.020 | -.173 | -.173 |
| | | Significance (2-tailed) | .081 | .038 | .673 | . | .021 | .982 | .450 | .250 | .121 | .000 | .902 | .293 | .293 |
| | | df | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | Anxious Attachment | Correlation | -.090 | .002 | .128 | .367 | 1.000 | -.110 | .104 | -.229 | -.036 | -.318 | .008 | -.207 | -.093 |
| | | Significance (2-tailed) | .587 | .990 | .438 | .021 | . | .504 | .529 | .160 | .829 | .048 | .960 | .206 | .575 |
| | | df | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |
| | Eyes | Correlation | .041 | -.019 | .192 | -.004 | -.110 | 1.000 | .448 | .116 | .190 | .309 | .172 | .085 | -.001 |
| | | Significance (2-tailed) | .803 | .910 | .242 | .982 | .504 | . | .004 | .484 | .247 | .056 | .295 | .606 | .997 |
| | | df | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 | 37 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facial Emotion | Correlation | -.090 | -.141 | .253 | -.125 | .104 | .448 | 1.000 | .070 | .280 | .284 | .193 | -.115 | .022 |
| | Significance (2-tailed) | .586 | .393 | .120 | .450 | .529 | .004 | . | .674 | .084 | .079 | .238 | .485 | .895 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 | 37 |
| IRI Persp taking | Correlation | .191 | .083 | -.001 | -.189 | -.229 | .116 | .070 | 1.000 | .592 | .497 | .226 | .147 | .109 |
| | Significance (2-tailed) | .245 | .614 | .996 | .250 | .160 | .484 | .674 | . | .000 | .001 | .166 | .371 | .509 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 | 37 |
| IRI Empathic conc | Correlation | .054 | -.034 | .330 | -.252 | -.036 | .190 | .280 | .592 | 1.000 | .583 | -.066 | -.055 | -.049 |
| | Significance (2-tailed) | .745 | .836 | .040 | .121 | .829 | .247 | .084 | .000 | . | .000 | .689 | .740 | .765 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 | 37 |
| EQ | Correlation | .292 | .245 | .180 | -.536 | -.318 | .309 | .284 | .497 | .583 | 1.000 | .029 | .192 | .329 |
| | Significance (2-tailed) | .071 | .133 | .274 | .000 | .048 | .056 | .079 | .001 | .000 | . | .862 | .242 | .041 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 | 37 |
| Perspective Taking Accuracy | Correlation | .172 | .063 | .110 | -.020 | .008 | .172 | .193 | .226 | -.066 | .029 | 1.000 | .183 | .201 |
| | Significance (2-tailed) | .295 | .705 | .504 | .902 | .960 | .295 | .238 | .166 | .689 | .862 | . | .265 | .220 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 | 37 |
| Total eye fix | Correlation | .702 | .555 | .288 | -.173 | -.207 | .085 | -.115 | .147 | -.055 | .192 | .183 | 1.000 | .601 |
| | Significance (2-tailed) | .000 | .000 | .075 | .293 | .206 | .606 | .485 | .371 | .740 | .242 | .265 | . | .000 |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 | 37 |
| First eye fix | Correlation | .217 | .167 | .137 | -.173 | -.093 | -.001 | .022 | .109 | -.049 | .329 | .201 | .601 | 1.000 |
| | Significance (2-tailed) | .184 | .308 | .406 | .293 | .575 | .997 | .895 | .509 | .765 | .041 | .220 | .000 | . |
| | df | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 0 |

Eyetracking data for the Pictures task without zero values (data with zeros is included in the main text)

Descriptive statistics and independent sample t-tests

| Measure | Therapists | | | Non-therapists | | | All Participants | | | t-test (one-tailed) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Standard deviation | Range | Mean | Standard deviation | Range | Mean | Standard deviation | Range | |
| Average picture fixation | 50.52 | 37.65 | 14.19-172.39 | 35.89 | 24.04 | 7.55-101.99 | 43.03 | 31.89 | 7.55-172.39 | t(39) = 1.49, p=0.07[m] |
| Average fixation faces (no zeros) | 8.28 | 4.78 | 1.94-21.14 | 6.96 | 5.06 | 1.25-20.65 | 7.61 | 4.91 | 1.25-21.14 | t(39) = 0.86, p=0.20 |
| Average fixation hands (no zeros) | 1.66 | 0.72 | 0.35-2.91 | 1.21 | 0.79 | 0.16-3.25 | 1.43 | 0.78 | 0.16-3.25 | t(39) = 1.91, p=0.03* |
| Sum of average fix for faces and hands (no zeros) | 9.94 | 5.33 | 2.65-23.57 | 8.17 | 5.67 | 1.56-23.12 | 9.03 | 5.52 | 1.56-23.57 | t(39) = 1.03, p=0.16 |
| Average duration of first fix | 0.18 | 0.07 | 0.08-0.38 | 0.18 | 0.05 | 0.07-0.26 | 0.18 | 0.06 | 0.07-0.38 | t(39) = 0.22, p=0.41 |
| Average duration of first face fix (no zeros) | 0.36 | 0.10 | 0.21-0.52 | 0.33 | 0.10 | 0.17-0.52 | 0.35 | 0.10 | 0.17-0.52 | t(39) = 1.00, p=0.16 |
| Average duration of first hand fix (no zeros) | 0.31 | 0.09 | 0.12-0.48 | 0.26 | 0.10 | 0.13-0.45 | 0.29 | 0.10 | 0.12-0.48 | t(39) = 1.72, p=0.047* |
| Sum of faces and hands duration of first fix (no zeros) | 0.68 | 0.17 | 0.38-0.94 | 0.59 | 0.19 | 0.30-0.97 | 0.63 | 0.18 | 0.30-0.97 | t(39) = 1.50, p=0.07[m] |
| Average time to first fix | 0.24 | 0.51 | 0.00-2.22 | 0.28 | 0.51 | 0.00-2.14 | 0.26 | 0.51 | 0.00-2.22 | t(39) =-0.24, p=0.41 |
| Average time to first face fix | 1.12 | 1.66 | 0.18-5.77 | 1.01 | 0.99 | 0.19-3.27 | 1.06 | 1.34 | 0.18-5.77 | t(39) = 0.28, p=0.39 |
| Average time to first hand fix | 11.89 | 5.76 | 4.76-28.07 | 11.19 | 6.98 | 2.64-29.16 | 11.54 | 6.34 | 2.64-29.16 | t(39) = 0.35, p=0.37 |
| Average time to first fix | 0.24 | 0.51 | 0.00-2.22 | 0.28 | 0.51 | 0.00-2.14 | 0.26 | 0.51 | 0.00-2.22 | t(39) =-0.24, p=0.41 |

One tailed, *significant at 0.05 level, **significant at 0.01 level

Eyetracking data for the Pictures task without zero values (data with zeros is included in the main text)

Pearson correlations between attachment coefficient and eye-tracking measures.

| Pearson's r | Therapists | | Non-therapists | |
|---|---|---|---|---|
| | Avoidant | Anxious | Avoidant | Anxious |
| Average picture fixation | .096 | .044 | -.334 | -.428* |
| Average fixation faces (no zeros) | -.121 | -.049 | -.274 | -.390* |
| Average fixation hands (no zeros) | .287 | .113 | -.344 | -.538** |
| Sum faces and hands average (no zeros) | -.069 | -.029 | -.292 | -.423* |
| Average fixation faces (with zeros) | -.099 | -.051 | -.257 | -.391* |
| Average fixation hands (with zeros) | .240 | .108 | -.431* | -.483* |
| Sum faces and hands average (with zeros) | -.057 | -.031 | -.292 | -.422* |
| | | | | |
| Average duration of first fix | -.437* | .207 | .161 | -.212 |
| Average duration of first face fix (no zeros) | -.091 | .012 | -.422* | -.261 |
| Average duration of first hand fix (no zeros) | .225 | .240 | -.476* | -.196 |
| Sum faces and hands first fix (no zeros) | .074 | .143 | -.477* | -.242 |
| Average duration of first face fix (with zeros) | -.034 | 0.14 | -.372* | -.301 |
| Average duration of first hand fix (with zeros) | .257 | .224 | -.641** | -.336 |
| Sum faces and hands first fix (with zeros) | .151 | .158 | -.546** | -.347 |
| | | | | |
| Average time to first fix | -.284 | -.034 | .152 | .180 |
| Average time to first face fix | -.027 | .117 | .042 | .280 |
| Average time to first hand fix | -.219 | -.006 | -.071 | .183 |

Two tailed, *significant at 0.05 level, **significant at 0.01 level

Eye-tracking data including "without zeros". Pearson correlation coefficients for the eye-tracking data and other measures – therapists. **Appendix 22 continued.**

| | Self-report measures | | | | | | ToM understanding | | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IRI Perspective Taking | IRI Empathic concern | AQ AUS | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Perspective net reaction time | Mental state language | Mental state elaboration | LEAS |
| Average picture fixation | .246 | -.033 | -.109 | -.014 | .139 | -.269 | -.008 | .206 | .206 | -.177 | .780** | .202 | .057 |
| Average fixation faces (no zeros) | .160 | -.078 | -.189 | .056 | .130 | .007 | -.025 | .196 | .205 | -.087 | .789** | .413* | .286 |
| Average fixation hands (no zeros) | -.042 | -.200 | -.003 | -.219 | -.060 | -.265 | -.002 | .141 | .097 | -.320 | .636** | .055 | .176 |
| Sum faces and hands average (no zeros) | .138 | -.097 | -.170 | .020 | .108 | -.030 | -.023 | .195 | .197 | -.122 | .793** | .377[n] | .280 |
| Average fixation faces (with zeros) | .142 | -.097 | -.168 | .030 | .095 | -.010 | -.016 | .168 | .219 | -.075 | .803** | .430* | .294 |
| Average fixation hands (with zeros) | .079 | -.151 | -.022 | -.153 | .044 | -.221 | .083 | .217 | .213 | -.314 | .708** | .049 | .095 |
| Sum faces and hands average (with zeros) | .137 | -.107 | -.153 | .007 | .091 | -.039 | -.003 | .179 | .224 | -.109 | .811** | .390* | .275 |
| Average duration of first fix | -.219 | -.281 | .043 | -.048 | -.258 | -.053 | -.630** | -.346[n] | -.250 | .305 | -.158 | .436* | -.200 |
| Average duration of first face fix (no zeros) | -.360[n] | -.099 | -.167 | .036 | .008 | .001 | -.383* | -.083 | -.135 | .199 | -.218 | .015 | .223 |
| Average duration of first hand fix (no zeros) | -.113 | -.377[n] | .052 | -.245 | -.039 | -.415* | -.307 | .024 | .250 | -.195 | .261 | .025 | .050 |
| Sum faces and hands first fix (no zeros) | -.275 | -.271 | -.069 | -.117 | -.017 | -.234 | -.398* | -.035 | .060 | .010 | .020 | .023 | .159 |
| Average duration of first face fix (with zeros) | -.423* | -.174 | -.104 | -.035 | -.097 | -.033 | -.366[n] | -.166 | -.083 | .225 | -.179 | .081 | .277 |
| Average duration of first hand fix (with zeros) | .048 | -.316 | .038 | -.191 | .060 | -.350[n] | -.127 | .134 | .377[n] | -.275 | .470* | .019 | .021 |
| Sum faces and hands first fix (with zeros) | -.229 | -.319 | -.039 | -.149 | -.020 | -.254 | -.311 | -.013 | .201 | -.042 | .204 | .063 | .185 |
| Average time to first fix | .332 | .361[n] | -.048 | .266 | .181 | .151 | .142 | .137 | .205 | -.323 | .091 | .255 | -.135 |
| Average time to first face fix | .486* | .047 | .075 | .094 | .195 | -.272 | .012 | .188 | .377[n] | -.346 | .283 | .163 | -.259 |
| Average time to first hand fix | .390* | .189 | .008 | .251 | .180 | .096 | .008 | -.007 | .173 | -.312 | .468* | .378[n] | -.125 |

One-tailed tests, * correlation significant at the .01 level, **correlation significant at the .05 level

Eye-tracking data including "without zeros". Table [ ] Pearson correlation coefficients for the eye-tracking data and other measures – Non-therapists. **Appendix 22 continued**

| | Self-report measures | | | | | | ToM understanding | | | | ToM production | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | IRI Perspective Taking | IRI Empathic concern | AQ AUS | EQ total | EQ Cognitive Empathy | EQ Emotional Reactivity | Eyes Test | Facial Emotion | Perspective correct answers | Perspective net reaction time | Mental state language | Mental state elaboration | LEAS |
| Average picture fixation | .067 | -.057 | -.352[m] | .321 | .239 | .254 | .270 | -.392* | .134 | .042 | .633** | .546** | .283 |
| Average fixation faces (no zeros) | .006 | -.140 | -.212 | .169 | .137 | .100 | .124 | -.526** | -.002 | .004 | .542** | .585** | .225 |
| Average fixation hands (no zeros) | .330 | .002 | -.366[m] | .361[m] | .260 | .367[m] | .239 | -.333 | .180 | .025 | .514** | .302 | -.002 |
| Sum faces and hands average (no zeros) | .052 | -.124 | -.240 | .201 | .158 | .140 | .144 | -.515** | .023 | .000 | .555** | .564** | .201 |
| Average fixation faces (with zeros) | .006 | -150 | -.204 | .160 | .128 | .089 | .120 | -.527** | .003 | -.001 | .551** | .590** | .219 |
| Average fixation hands (with zeros) | .268 | .052 | -.402* | .449* | .372* | .413* | .301 | -.188 | .343[m] | -.014 | .571** | .217 | .104 |
| Sum faces and hands average (with zeros) | .040 | -.131 | -.239 | .205 | .166 | .135 | .149 | -.508** | .047 | -.002 | .580** | .570** | .214 |
| Average duration of first fix | .358[m] | -.076 | -.154 | -.004 | -.078 | -.058 | -.009 | -.172 | -.125 | -.089 | -.171 | .002 | -.228 |
| Average duration of first face fix (no zeros) | .166 | .118 | -.381* | .418* | .258 | .364[m] | .029 | -.196 | -.155 | -.303 | -.008 | .101 | -.070 |
| Average duration of first hand fix (no zeros) | .192 | .057 | -.407* | .515** | .389* | .545* | .216 | .052 | -.018 | -.176 | .012 | .013 | .015 |
| Sum faces and hands first fix (no zeros) | .191 | .092 | -.419* | .496* | .345[m] | .484* | .132 | -.074 | -.091 | -.253 | .002 | .059 | -.029 |
| Average duration of first face fix (with zeros) | .167 | .057 | -.372* | .387* | .228 | .330 | .017 | -.213 | -.116 | -.279 | .051 | .145 | -.102 |
| Average duration of first hand fix (with zeros) | .092 | .001 | -.511** | .573** | .488* | .547** | .266 | .017 | .306 | -.155 | .235 | .037 | .118 |
| Sum faces and hands first fix (with zeros) | .144 | .033 | -.479* | .520** | .384* | .473* | .148 | -.114 | .092 | -.241 | .152 | .102 | .003 |
| Average time to first fix | .072 | .081 | -.078 | .296 | .220 | .328 | .092 | .206 | -.402* | -.208 | .210 | .369[m] | -.228 |
| Average time to first face fix | -.065 | .176 | -.158 | .183 | .200 | .332 | -.149 | .217 | -.314 | -.180 | .303 | .290 | -.112 |
| Average time to first hand fix | .020 | .134 | -.250 | .123 | .142 | .023 | -.104 | .192 | .064 | -.213 | .352[m] | .289 | .234 |

One-tailed tests, * correlation significant at the .01 level, **correlation significant at the .05 level

Pearson r Coefficients for whole data set, partial correlation coefficient for anxiety, partial correlation coefficient for AQ **Appendix 23**

| | | Mental state talk | Elaboration | LEAS | Avoidant Attach. | Anxious Attach. | Eyes | Facial Emotion | IRI Persp Taking | IRI Empathic concern | EQ | Perspective taking accuracy | Total fix social info | First fix social info |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mental state talk | Whole | - | .67** | .18 | -.20 | -.13 | .05 | -.06 | .13 | -.02 | .20 | .15 | .69** | .19 |
| | Anxiety | - | .68** | .21 | -.17 | - | .04 | -.05 | .11 | -.02 | .17 | .15 | .69** | .18 |
| | AQ | - | .64** | .16 | -.03 | .07 | -.02 | -.13 | .02 | -.15 | -.05 | .13 | .68** | .09 |
| Elaboration | Whole | | - | .21 | -.35* | .03 | -.03 | -.15 | .12 | .02 | .28 | .07 | .50** | .17 |
| | Anxiety | | - | .21 | -.40* | - | -.02 | -.16 | .13 | .02 | .31 | .07 | .54** | .18 |
| | AQ | | - | .20 | -.28 | .22 | -.08 | -.22 | .03 | -.07 | .17 | .06 | .49** | .10 |
| LEAS | Whole | | | - | -.11 | .15 | .19 | .23 | .03 | .36* | .22 | .12 | .27 | .15 |
| | Anxiety | | | - | -.16 | - | .20 | .22 | .06 | .36* | .27 | .12 | .31 | .16 |
| | AQ | | | - | -.06 | .25 | .17 | .22 | -.01 | .35* | .22 | .11 | .25 | .12 |
| Avoidant Attachment | Whole | | | | - | .31 | -.01 | -.09 | -.21 | -.31 | -.57** | -.03 | -.18 | -.20 |
| | Anxiety | | | | - | - | .04 | -.14 | -.17 | -.32 | -.52** | -.04 | -.08 | -.17 |
| | AQ | | | | - | -.03 | .15 | .02 | .00 | -.13 | -.25 | .01 | -.01 | .03 |
| Anxious Attachment | Whole | | | | | - | -.11 | .09 | -.20 | .01 | -.26 | .02 | -.21 | -.08 |
| | Anxiety | | | | | - | - | - | - | - | - | - | - | - |
| | AQ | | | | | - | .00 | .26 | -.03 | .27 | .29 | .07 | -.11 | .16 |
| Eyes | Whole | | | | | | - | .44** | .11 | .18 | .30 | .17 | .10 | .01 |
| | Anxiety | | | | | | - | .46** | .09 | .18 | .27 | .17 | .07 | -.01 |
| | AQ | | | | | | - | .43** | .04 | .12 | .21 | .16 | .04 | -.08 |
| Facial Emotion | Whole | | | | | | | - | .05 | .24 | .24 | .19 | -.11 | .01 |
| | Anxiety | | | | | | | - | .07 | .24 | .28 | .19 | -.09 | .02 |
| | AQ | | | | | | | - | -.03 | .20 | .15 | .18 | -.16 | -.06 |
| IRI Perspective Taking | Whole | | | | | | | | - | .61** | .51** | .23 | .13 | .12 |
| | Anxiety | | | | | | | | - | .62** | .49** | .24 | .09 | .10 |
| | AQ | | | | | | | | - | .55** | .38* | .22 | .05 | -.02 |
| IRI Empathic concern | Whole | | | | | | | | | - | .62** | -.05 | -.06 | -.02 |
| | Anxiety | | | | | | | | | - | .64** | -.05 | -.08 | -.03 |
| | AQ | | | | | | | | | - | .56** | -.07 | -.17 | -.17 |
| EQ | Whole | | | | | | | | | | - | .04 | .17 | .34* |
| | Anxiety | | | | | | | | | | - | .05 | .11 | .32 |
| | AQ | | | | | | | | | | - | -.01 | -.02 | .12 |
| Perspective taking accuracy | Whole | | | | | | | | | | | - | .18 | .20 |
| | Anxiety | | | | | | | | | | | - | .18 | .21 |
| | AQ | | | | | | | | | | | - | .16 | .19 |
| Total fix social info | Whole | | | | | | | | | | | | - | .60** |
| | Anxiety | | | | | | | | | | | | - | .59** |
| | AQ | | | | | | | | | | | | - | .56** |
| First fix social info | Whole | | | | | | | | | | | | | - |
| | Anxiety | | | | | | | | | | | | | - |
| | AQ | | | | | | | | | | | | | - |

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).